INDEPENDENT ORBITER ASSESSMENT

ANALYSIS
OF THE
REACTION CONTROL
SYSTEM
Vol. 2 of 3

19 JANUARY 1987

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 815

MANIFOLD 3, OX & FU ISOL VLV SWITCH CLOSE CONTACTS ITEM:

5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 3, OX & FU ISOL VLVS

5) MANIFOLD 3, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S32 PART NUMBER: 33V73A8S32

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY SWITCH OR MDM COMMAND, BUT CANNOT BE CLOSED BY SWITCH COMMAND, ONLY BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 816 ABORT: 2/1R

ITEM:

MANIFOLD 3, OX & FU ISOL VLV SWITCH CLOSE CONTACTS

5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 3, OX & FU ISOL VLVS

MANIFOLD 3, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6

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7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 08 S32 PART NUMBER: 33V73A8S32

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY SWITCH OR IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH MDM COMMAND. IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN AND CAN BE CLOSED WITH THE SWITCH, BUT CANNOT BE OPENED AGAIN BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CLOSE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF THE MDM COMMAND PATH WILL AFFECT ONORBIT OPERATIONS, PROPELLANT DUMP LENGTHS DURING ABORTS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

3/3 FLIGHT: SUBSYSTEM: FRCS 3/3 ABORT: 817 MDAC ID:

MANIFOLD 4, OX & FU ISOL VLV SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, OX & FU ISOL VLVS
 5) MANIFOLD 4, OX & FU ISOL VLV SWITCH

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S33 PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE OPEN CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 818 ABORT: 2/1R

ITEM: MANIFOLD 4, OX & FU ISOL VLV SWITCH FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, OX & FU ISOL VLVS
- 5) MANIFOLD 4, OX & FU ISOL VLV SWITCH

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	2/1R	
LIFTOFF:	3/3	TAL:	3/2R	
ONORBIT:	3/2R	AOA:	3/2R	
DEORBIT:	3/2R	ATO:	3/2R	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 S33 PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE SWITCH'S CLOSE CONTACTS AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE MDM COMMAND PATH WILL AFFECT ONORBIT OPERATIONS, PROPELLANT DUMP LENGTHS DURING ABORTS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 819 ABORT: 2/1R

ITEM: MANIFOLD 4, OX & FU ISOL VLV SWITCH FAILURE MODE: SWITCH FAILS IN THE GPC POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, OX & FU ISOL VLVS

5) MANIFOLD 4, OX & FU ISOL VLV SWITCH

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7)

8) 9)

CRITICALITIES

HDW/FUN':	ABORT	HDW/FUNC
3/3	RTLS:	2/1R
3/3	TAL:	3/2R
3/2R	AOA:	3/2R
•	ATO:	3/2R
3/3		
	3/3 3/2R 3/2R	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/2R ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 S33
PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

VALVE CAN NOT BE CONTROLLED BY SWITCH, ONLY BY MDM OPEN OR CLOSE COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE MDM COMMAND PATH WHILE THE VALVE IS IN THE CLOSED POSITION WILL AFFECT ONORBIT OPERATIONS, PROPELLANT DUMP LENGTH DURING ABORTS AND ENTRY, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/13/87

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 820 ABORT: 2/1R

MANIFOLD 4, OX & FU ISOL VLV SWITCH OPEN CONTACTS ITEM:

1, 2

FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, OX & FU ISOL VLVS

MANIFOLD 4, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 08 S33 PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CANNOT BE OPENED BY SWITCH COMMAND, ONLY BY MDM COMMAND, AND CAN CLOSED BY THE SWITCH OR THE MDM. FAILURE OF THE MDM COMMAND PATH WILL AFFECT ONORBIT OPERATIONS, PROPELLANT DUMP LENGTHS DURING ABORTS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 821 ABORT: 3/3

ITEM: MANIFOLD 4, OX & FU ISOL VLV SWITCH OPEN CONTACTS

1, 2

FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, OX & FU ISOL VLVS

5) MANIFOLD 4, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2

6) 7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S33
PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED AND CAN BE OPENED WITH THE SWITCH, BUT CANNOT BE CLOSED AGAIN BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 822 ABORT: 3/3

ITEM: MANIFOLD 4, OX & FU ISOL VLV SWITCH GPC CONTACTS 3,

FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, OX & FU ISOL VLVS
- 5) MANIFOLD 4, OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		- / -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S33 PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/13/87 FLIGHT: 3/3 SUBSYSTEM: FRCS

3/3 ABORT: MDAC ID: 823

MANIFOLD 4, OX & FU ISOL VLV SWITCH GPC CONTACTS 3, ITEM:

FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, OX & FU ISOL VLVS 5) MANIFOLD 4, OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING	3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S33 PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 824 ABORT: 3/3

ITEM: MANIFOLD 4, OX & FU ISOL VLV SWITCH CLOSE CONTACTS

5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, OX & FU ISOL VLVS
- 5) MANIFOLD 4, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6

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8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S33 PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY SWITCH OR MDM COMMAND, BUT CANNOT BE CLOSED BY SWITCH COMMAND, ONLY BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 825 ABORT: 2/1R

ITEM: MANIFOLD 4, OX & FU ISOL VLV SWITCH CLOSE CONTACTS

5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, OX & FU ISOL VLVS

5) MANIFOLD 4, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 08 S33 PART NUMBER: 33V73A8S33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY SWITCH OR MDM COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN AND CAN BE CLOSED WITH THE SWITCH, BUT CANNOT BE OPENED AGAIN BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CLOSE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF THE MDM COMMAND PATH WILL AFFECT ONORBIT OPERATIONS, PROPELLANT DUMP LENGTHS DURING ABORTS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 826 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S34
PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO REDUNDANCY PROVIDED TO CLOSE THE VALVE. IF THE SWITCH FAILS IN THE OPEN POSITION WHILE THE VALVE IS IN ANY POSITION, THE VALVE WILL OPEN. FAILURE WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: 827 MDAC ID:

MANIFOLD 5, OX & FU ISOL VLV SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, OX & FU ISOL VLVS

5) MANIFOLD 5, OX & FU ISOL VLV SWITCH

6) 7)

8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
: 3/3		
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

PNL 08 S34 LOCATION: PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMAND. IF THE SWITCH FAILS IN THE CLOSED POSITION WHILE THE VALVE IS IN ANY POSITION, THE VALVE WILL CLOSE. IF THE MDM OPEN COMMAND IS ALSO PRESENT, OR THE SWITCH OPEN COMMAND IS ALSO PRESENT THE VALVE WILL CYCLE OPEN AND CLOSED UNTIL THE MDM OR SWITCH OPEN COMMAND IS REMOVED, OR UNTIL THE CONTROL BUS POWER IS REMOVED FROM EITHER OF THE SWITCH'S CLOSE CONTACTS. TO OPEN THE VALVE, CREW MUST REMOVE POWER FROM EITHER OF THE SWITCH'S CLOSE CONTACTS, AND USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPERATIONS, AND WILL CAUSE THE LOSS OF THE VERNIER RCS.

DATE:

1/13/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT:

3/2R

MDAC ID: 828

ABORT:

3/3

ITEM:

MANIFOLD 5, OX & FU ISOL VLV SWITCH

FAILURE MODE: SWITCH FAILS IN THE GPC POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH

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8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/2R	AOA:	3/3
	3/3	ATO:	3/3
LANDING/SAFING:	- / -	ATO:	3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 S34

PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. IF THE VALVE IS CLOSED AND THE MDM OPEN COMMAND PATH FAILS, THE VALVE CANNOT BE OPENED BY THE MDM SWITCH COMMANDS, CAUSING THE LOSS OF THE VERNIER RCS.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 829 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS

1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE F	IDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S34
PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 830 3/3 ABORT:

MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS ITEM:

1, 2

FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
- 6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 534 PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 831 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 3,

4

FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4

6) 7)

8) 9)

CRITICALITIES

40,400 - 40,440 - 40,440			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S34
PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3

MDAC ID: 832 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 3,

FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S34 PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/13/87

3/3 FLIGHT: SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 833

MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS ITEM:

5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, OX & FU ISOL VLVS 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S34 PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM CLOSE COMMAND. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY THE SWITCH OR BY THE MDM COMMAND, AND CANNOT BE CLOSED BY THE SWITCH COMMAND, ONLY BY THE MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 834 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS

5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6

6)

7) 8)

9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 08 S34
PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS AND THE OTHER SWITCH CLOSE CONTACTS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE GPC OR CLOSED POSITION, THE VALVE WILL CLOSE, AND CANNOT BE OPENED BY MDM COMMAND, ONLY BY THE SWITCH COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN, AND CANNOT BE CLOSED BY MDM COMMAND, ONLY BY SWITCH COMMAND. TO OPEN THE VALVE WITH THE MDM COMMAND, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CLOSE CONTACT SET 5,6 THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL CAUSE THE LOSS OF THE VERNIER RCS.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/2R

SUBSYSTEM: FRCS FLIGHT: 3/21
MDAC ID: 835

ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS

7, 8

FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, OX & FU ISOL VLVS

5) MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 08 S34
PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMAND. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE CLOSED BY SWITCH OR MDM COMMAND, BUT CANNOT BE OPENED BY SWITCH COMMAND, ONLY BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO OPEN THE VALVE, AND WILL CAUSE LOSS OF THE VERNIER RCS.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 836 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS

7,8

FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, OX & FU ISOL VLVS

5) MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S34
PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO REDUNDANCY PROVIDED TO CLOSE THE VALVE. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, OR IF THE MDM CLOSE COMMAND IS ALSO PRESENT, THE VALVE WILL CYCLE OPEN AND CLOSED UNTIL CONTROL BUS POWER TO THE OPEN OR CLOSE CONTACTS IS REMOVED, OR UNTIL THE MDM CLOSE COMMAND IS REMOVED.
FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CLOSE THE

FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CLOSE TH VALVE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 837 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 9,

10

FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, OX & FU ISOL VLVS

5) MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [P] C [P]

· LOCATION: PNL 08 S34 PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMAND AND THE MANUAL SWITCH COMMAND. IF THE GPC CONTACTS FAIL OPEN, THE VALVE CAN BE OPENED BY SWITCH OR MDM COMMAND, CAN BE CLOSED BY SWITCH COMMAND, AND CANNOT BE CLOSED BY MDM COMMAND UNLESS THE SWITCH IS IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF THE VERNIER RCS.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 838 ABORT: 3/3

ITEM:

MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 9,

10

FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL 08 S34 PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE OTHER CLOSE CONTACTS AND THE SWITCH AND MDM OPEN COMMANDS. FIRST FAILURE WILL HAVE NO EFFECT. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO OPEN THE VALVE AMD LOSS OF THE VERNIER RCS.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 839

FLIGHT: 3/3
ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS

11, 12

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, OX & FU ISOL VLVS
- 5) MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11, 12

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 08 S34
PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO REDUNDANCY. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY THE SWITCH OR BY MDM COMMAND, BUT CANNOT BE CLOSED BY THE SWITCH OR MDM COMMAND. FAILURE WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 840 ABORT: 3/3

ITEM: MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS

11, 12

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, OX & FU ISOL VLVS

MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11, 12

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠, ٠

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL 08 S34 PART NUMBER: 33V73A8S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE OTHER SWITCH CLOSE CONTACTS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, AND CAN BE CLOSED AND OPENED BY SWITCH OR MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO OPEN THE VALVE, AND LOSS OF THE VERNIER RCS.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 841

FU TK ULLAGE PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- FU TK ULLAGE PRESS SENSOR

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 842 ABORT: 3/3

ITEM: FU TK ULLAGE PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- FU TK ULLAGE PRESS SENSOR

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 843

FU TK OUT PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- 5) FU TK OUT PRESS SENSOR

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 844 ABORT: 3/3

ITEM: FU TK OUT PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- 5) FU TK OUT PRESS SENSOR

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		J J

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 845

OX TK ULLAGE PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- 5) OX TK ULLAGE PRESS SENSOR

6)

7)

8) 9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 846 3/3 ABORT:

ITEM: OX TK ULLAGE PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- 5) OX TK ULLAGE PRESS SENSOR

6) 7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		.,
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 847

ITEM: OX TK OUT PRESS SENSOR

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- 5) OX TK OUT PRESS SENSOR

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3

MDAC ID: 848 ABORT: 3/3

ITEM: OX TK OUT PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- OX TK OUT PRESS SENSOR

6)

7) 8)

9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 849

ITEM: FU PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- 5) FU PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR

6) 7)

8) 9)

#### CRITICALITIES

O1/1 1 1 O1/11 1 1 1 1 1 1 1 1 1 1 1 1 1			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFI	NG: ,3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 850 ABORT: 3/3

FU PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR ITEM: FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION 2)
- PROP STOR & DIST SUBSYSTEM
- FU TK 4)
- FU PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR

6) 7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 851 MDAC ID:

FU FILL LINE TEMP SENSOR ITEM:

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- 5) FU FILL LINE TEMP SENSOR
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

U1\1 1 1 U1		
HDW/FUNC	ABORT	HDW/FUNC
•	RTLS:	3/3
• .	TAL:	3/3
•	AOA:	3/3
3/3	ATO:	3/3
3/3		
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 852 ABORT: 3/3

ITEM: FU FILL LINE TEMP SENSOR

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- 5) FU FILL LINE TEMP SENSOR

6)

7) 8)

9)

### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		-, -
	HDW/FUNC 3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 853

L FUEL PRESS LINE BACKUP TEMP SENSOR ITEM:

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) PROP STOR & DIST SUBSYSTEM

4) FU TK

5) L FUEL PRESS LINE BACKUP TEMP SENSOR

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	•		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT605

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 854 ABORT: 3/3

ITEM: L FUEL PRESS LINE BACKUP TEMP SENSOR

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) FU TK
- L FUEL PRESS LINE BACKUP TEMP SENSOR

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		<b>J</b> / <b>J</b>

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT605

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS 855 MDAC ID:

OX FILL LINE TEMP SENSOR ITEM:

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- OX FILL LINE TEMP SENSOR
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 856

ITEM: OX FILL LINE TEMP SENSOR

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- OX FILL LINE TEMP SENSOR 5)
- 6)
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	: 3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 857

OX PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR ITEM:

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK 5) OX PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 858 3/3 ABORT:

ITEM: OX PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK

5) OX PRESS LINE (NEAR THERMOSTAT) TEMP SENSOR

6) 7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 859

ITEM: OX PRESS LINE TEMP BACKUP SENSOR

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM 4) OX TK
- 5) OX PRESS LINE TEMP BACKUP SENSOR
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	. 3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 860 ABORT: 3/3

ITEM: OX PRESS LINE TEMP BACKUP SENSOR

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- 5) OX PRESS LINE TEMP BACKUP SENSOR

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING VALVE. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS 861 MDAC ID:

OX TK TEMP-1 TEMP SENSOR ITEM:

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- 5) OX TK TEMP-1 TEMP SENSOR
- 6)
- 7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE AND REDUNDANT PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 862 ABORT: 3/3

ITEM: OX TK TEMP-1 TEMP SENSOR

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) OX TK
- 5) OX TK TEMP-1 TEMP SENSOR

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
Landing/Safing:	3/3		, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE AND REDUNDANT PRESSURE SENSORS WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 863

FU MANIF PRESS-1 PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM 4) MANIFOLD 1, FU
- 5) FU MANIF PRESS-1 PRESS SENSOR

7) 8)

9)

### CRITICALITIES

CVTITCULLITIO		
HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		
	HDW/FUNC 3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 864 ABORT: 3/3

ITEM: FU MANIF PRESS-1 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION 2)
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, FU
- 5) FU MANIF PRESS-1 PRESS SENSOR
- 6) 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 865 ABORT: 3/3

ITEM: OX MANIF PRESS-1 PRESS SENSOR

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, OX
- 5) OX MANIF PRESS-1 PRESS SENSOR

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 866 ABORT: 3/3

ITEM: OX MANIF PRESS-1 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, OX
- 5) OX MANIF PRESS-1 PRESS SENSOR

6)

7) 8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 867

FU MANIF PRESS-2 PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
  3) PROP STOR & DIST SUBSYSTEM
  4) MANIFOLD 2, FU
- 5) FU MANIF PRESS-2 PRESS SENSOR
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	: 3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 868 3/3 ABORT:

ITEM: FU MANIF PRESS-2 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, FU
- FU MANIF PRESS-2 PRESS SENSOR 5)
- 6) 7)
- 8)
- 9)

# CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 869 MDAC ID:

OX MANIF PRESS-2 PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, OX

5) OX MANIF PRESS-2 PRESS SENSOR

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT24

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3

MDAC ID: 870 ABORT: 3/3

ITEM: OX MANIF PRESS-2 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, OX
- 5) OX MANIF PRESS-2 PRESS SENSOR

7)

8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3 .		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT24

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 871

FU MANIF PRESS-3 PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, FU
- 5) FU MANIF PRESS-3 PRESS SENSOR
- 6)
- 7)
- 8)
- 9)

### CRITICALITIES

	C7/T T T C53		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 872 3/3 ABORT:

ITEM: FU MANIF PRESS-3 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, FU
- FU MANIF PRESS-3 PRESS SENSOR

6) 7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		., .

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 873

OX MANIF PRESS-3 PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, OX
- 5) OX MANIF PRESS-3 PRESS SENSOR

6)

7) 8)

9)

### CRITTCALITTES

	111111	
HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
: 3/3		
	HDW/FUNC 3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 874 ABORT: 3/3

ITEM: OX MANIF PRESS-3 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM 4) MANIFOLD 3, OX
- 5) OX MANIF PRESS-3 PRESS SENSOR

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/TUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS 875 MDAC ID:

FU MANIF PRESS-4 PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION

- 3) PROP STOR & DIST SUBSYSTEM
  4) MANIFOLD 4, FU
  5) FU MANIF PRESS-4 PRESS SENSOR

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 876 ABORT: 3/3

ITEM: FU MANIF PRESS-4 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, FU 5) FU MANIF PRESS-4 PRESS SENSOR

6) 7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	: 3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 877

OX MANIF PRESS-4 PRESS SENSOR ITEM:

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
  4) MANIFOLD 4, OX
- 5) OX MANIF PRESS-4 PRESS SENSOR
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 878 ABORT: 3/3

ITEM: OX MANIF PRESS-4 PRESS SENSOR

FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, OX
- 5) OX MANIF PRESS-4 PRESS SENSOR

6) 7)

8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3	****	٥, ٥

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42MT25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FAILURE WILL CAUSE GROUND AND FLIGHT CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

3/1R FLIGHT: SUBSYSTEM: FRCS ABORT: 2/1R MDAC ID: 879

OX & FU TK ISOL VLV 1/2 & 3/4/5 SWITCH TALKBACK ITEM:

FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS

MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- PROP STOR & DIST SUBSYSTEM
- 4) OX & FU TK ISOL VLV 1/2 & 3/4/5
- 5) OX & FU TK ISOL VLV 1/2 & 3/4/5 SWITCH TALKBACK
- 6)
- 7)
- 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 08 DS9, DS10 PART NUMBER: 33V73A8DS9; DS10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FWD RCS TK ISOL 1/2 & 3/4/5 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 880 ABORT: 2/1R

ITEM: MANIFOLD 1, OX & FU ISOL VLV SWITCH TALKBACK

FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS

MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, OX & FU ISOL VLVS
- 5) MANIFOLD 1, OX & FU ISOL VLV SWITCH TALKBACK

6)

7) 8)

9)

### CRITICALITIES

	~~~~~~~		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 DS16 PART NUMBER: 33V73A8DS16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FWD RCS MANIF ISOL 1 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/1R SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 881

MANIFOLD 2, OX & FU ISOL VLV SWITCH TALKBACK ITEM:

FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS

MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 2, OX & FU ISOL VLVS 5) MANIFOLD 2, OX & FU ISOL VLV SWITCH TALKBACK

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 DS17 PART NUMBER: 33V73A8DS17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FWD RCS MANIF ISOL 2 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 882 ABORT: 2/1R

MANIFOLD 3, OX & FU ISOL VLV SWITCH TALKBACK ITEM:

FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS

MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) PROP STOR & DIST SUBSYSTEM
 4) MANIFOLD 3, OX & FU ISOL VLVS
- MANIFOLD 3, OX & FU ISOL VLV SWITCH TALKBACK

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	2/1R
3/3	TAL:	3/1R
3/2R	AOA:	3/1R
3/1R	ATO:	3/1R
3/3		•
	3/3 3/3 3/2R 3/1R	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 DS18 PART NUMBER: 33V73A8DS18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FWD RCS MANIF ISOL 3 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 883

MANIFOLD 4, OX & FU ISOL VLV SWITCH TALKBACK ITEM:

FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS

MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, OX & FU ISOL VLVS

5) MANIFOLD 4, OX & FU ISOL VLV SWITCH TALKBACK

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 DS19 PART NUMBER: 33V73A8DS19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FWD RCS MANIF ISOL 4 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 884 ABORT: 3/3

MANIFOLD 5, OX & FU ISOL VLV SWITCH TALKBACK

FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS

MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, OX & FU ISOL VLVS

MANIFOLD 5, OX & FU ISOL VLV SWITCH TALKBACK

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		5/5

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 08 DS20 PART NUMBER: 33V73A8DS20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FWD RCS MANIF ISOL 5 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2
MDAC ID: 885 ABORT: 1/1

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	1/1	
LIFTOFF:	3/3	TAL:	2/2	
ONORBIT:	2/2	AOA:	2/2	
DEORBIT:	2/2	ATO:	2/2	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22RPC39

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 886 3/3 ABORT:

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22RPC39

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS ABORT: 1/1 MDAC ID: 887

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 1, RJDF 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

CRITICALITIES

C1/T 1 T 011TT =			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
	•		•
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22RPC38

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER TO MANIFOLD DRIVER & LOGIC CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED DURING DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 888 ABORT: 3/3

ITEM:

CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	,
LANDING/SAFING:		AIO.	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22RPC38

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. FORWARD JETS NOT USED DURING DEORBIT. IF MANIFOLD LOGIC OR DRIVER POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 889 ABORT: 1/1

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23RPC36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 890 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/2	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		, -	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23RPC36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS ARE NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 ABORT: 1/1 SUBSYSTEM: FRCS MDAC ID: 891

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 2, RJDF
- 5) CONTROLLER, REMOTE POWER
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	•		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23RPC37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER TO MANIFOLD DRIVER & LOGIC CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED DURING DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 892 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23RPC37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. FORWARD JETS NOT USED DURING DEORBIT. IF MANIFOLD LOGIC OR DRIVER POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 893

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC40

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 894 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC40

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/2R ABORT: 2/1R SUBSYSTEM: FRCS 895 MDAC ID:

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF
- 5) CONTROLLER, REMOTE POWER
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC38

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED DURING DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 896 ABORT: 3/3

ITEM:

CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- MANIFOLD 3, RJDF 4)
- CONTROLLER, REMOTE POWER

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC	
3/3	RTLS:	3/3	
3/3	TAL:	3/3	
3/3	AOA:	3/3	
3/3	ATO:	3/3	
: 3/3		,	
	HDW/FUNC 3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC38

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. FORWARD JETS NOT USED DURING DEORBIT. IF MANIFOLD LOGIC OR DRIVER POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R ABORT: 2/1R SUBSYSTEM: FRCS 897 MDAC ID:

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

CRITICALITIES

CTITITION		
HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	2/1R
3/3	TAL:	3/2R
3/2R	AOA:	3/2R
3/2R	ATO:	3/2R
3/3		•
	HDW/FUNC 3/3 3/3 3/2R 3/2R	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/2R ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22RPC52

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 898 ABORT: 1/1

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22RPC52

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THEAPPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 899

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF

5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
•	RTLS:	2/1R
•	TAL:	3/2R
- /	AOA:	3/2R
3/2R	ATO:	3/2R
: 3/3		
	•	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/2R ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22RPC50

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED DURING DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 900 ABORT: 3/3

ITEM:

CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 3, RJDF

CONTROLLER, REMOTE POWER 5)

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:			3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22RPC50

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. FORWARD JETS NOT USED DURING DEORBIT. IF MANIFOLD LOGIC OR DRIVER POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 901

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
 4) MANIFOLD 4 & F5, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC39

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 902 ABORT: 1/1

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- MANIFOLD 4 & F5, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

	AT/T T T AU		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		- , -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER TO MANIFOLD DRIVER & LOGIC CIRCUITS. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED DURING DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. LOSS OF VERNIER MANIFOLD F5 (F5R AND F5L JETS) WILL RESULT IN LOSS OF VERNIER RCS ATTITUDE CONTROL. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS 903 MDAC ID:

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- 5) CONTROLLER, REMOTE POWER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

C1/# 1 7 C1127 1 2 2 2 2			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. FORWARD JETS NOT USED DURING DEORBIT. IF MANIFOLD LOGIC OR DRIVER POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 ABORT: 1/1 MDAC ID: 904 1/1 ABORT:

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- CONTROLLER, REMOTE POWER

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING	3: 3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC39

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87

2/2 SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: MDAC ID: 905

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- 5) CONTROLLER, REMOTE POWER

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	· 2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC51

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER TO VERNIER JET MANIFOLD F5 DRIVER POWER CIRCUIT. LOSS OF F5R AND F5L VERNIER JETS WILL RESULT IN LOSS OF VERNIER RCS ATTITUDE CONTROL.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 906 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC51

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO VERNIER JET MANIFOLD F5 (JETS F5R AND F5L) DRIVER POWER CIRCUIT. FAILURE MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 907

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC47

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER TO VERNIER JET MANIFOLD F5 DRIVER POWER CIRCUIT. LOSS OF F5R AND F5L VERNIER JETS WILL RESULT IN LOSS OF VERNIER RCS ATTITUDE CONTROL.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 908 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF

5) CONTROLLER, REMOTE POWER

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		., -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, PCA 3 PART NUMBER: 83V76A24RPC47

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO VERNIER JET MANIFOLD F5 (JETS F5R AND F5L) DRIVER POWER CIRCUIT. FAILURE MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2
MDAC ID: 909 ABORT: 1/1

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22CR35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 910

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

~		
HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		•
	HDW/FUNC 3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B[] C[]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22CR35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE HAS NO IMPACT ON POWER TO MANIFOLD DRIVER CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 2/1R MDAC ID: 911

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING	•		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 912

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
: 3/3		٠,٠
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 2/1R MDAC ID: 913

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 1, RJDF

DIODE

6)

7)

8) 9)

CRITICALITIES

01/TT T 01/TT T T T T T			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 914 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 ABORT: 1/1 SUBSYSTEM: FRCS MDAC ID: 915

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23CR40

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 916 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23CR40

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE HAS NO IMPACT ON POWER TO MANIFOLD DRIVER CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 2/1R MDAC ID: 917

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 2, RJDF

5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 918 ABORT: 3/3

ITEM:

DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 919

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS 3) THRUSTER SUBSYSTEM

4) MANIFOLD 2, RJDF

5) DIODE

6)

7) 8)

9)

CRITICALITIES

41/2 2 2 41100			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1CR6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 920 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1CR6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 921 ABORT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF

5) DIODE

6)

7)

8) 9)

CRITICALITIES

V1/4 5 4 V1+4-4 4 4			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1CR26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 922 ABORT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
Landing/Safing:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. SHORTED DIODE MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT DRIVER CIRCUIT COULD TRIP OPEN. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 923 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1CR11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 3 (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 924 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		,	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 925 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/1R	
LIFTOFF:	3/3	TAL:	3/2R	
ONORBIT:	3/2R	AOA:	3/2R	
DEORBIT:	3/2R	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT.

DURING RTLS, LOSS OF MANIFOLD 3 (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 926 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- DIODE 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 927

DIODE ITEM:

FAILURE MODE: FAILS OPEN

SUBSYS LEAD: D.J. PAUL LEAD ANALYST: R.A. O'DONNELL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR49

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 928 ABORT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- DIODE 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:			-,

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR49

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. SHORTED DIODE MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT DRIVER CIRCUIT COULD TRIP OPEN. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 929 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22A1CR19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 3 (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRIJET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 930

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/1R ABORT: MDAC ID: 931

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 3, RJDF

5) DIODE

6)

7) 8)

9)

CRITICALITIES

V1/2 2 2 V1.22 2 2 2 2 2			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 3 (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 932

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1CR20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT:
ABORT: 3/2R SUBSYSTEM: FRCS 2/1R MDAC ID: 933

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 3, RJDF

DIODE

6)

7)

8) 9)

CRITICALITIES

Q1/2 1 2 Q1/2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	2/1R
3/3	TAL:	3/2R
3/2R	AOA:	3/2R
3/2R	ATO:	3/2R
3/3		
	HDW/FUNC 3/3 3/3 3/2R 3/2R	HDW/FUNC ABORT 3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/2R ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22CRA1CR47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED DURING DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/2R ABORT: 2/1R MDAC ID: 934

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- DIODE 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22CRA1CR47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. SHORTED DIODE MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT LOGIC CIRCUIT COULD TRIP OPEN. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 2/1R MDAC ID: 935

DIODE ITEM:

FAILURE MODE: FAILS OPEN

SUBSYS LEAD: D.J. PAUL LEAD ANALYST: R.A. O'DONNELL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

61/T T CUTT T T T T			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22CRA1CR48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED DURING DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R 2/1R MDAC ID: 936 ABORT:

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	2/1R
3/3	TAL:	3/2R
3/2R	AOA:	3/2R
3/2R	ATO:	3/2R
3/3		•
	3/3 3/3 3/2R 3/2R	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/2R ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22CRA1CR48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. SHORTED DIODE MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT LOGIC CIRCUIT COULD TRIP OPEN. DURING RTLS, THE LOSS OF THE MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/1R MDAC ID: 937

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 4 & F5, RJDF

5) DIODE

6)

7)

8) 9)

CRITICALITIES

~*************************************			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 4 (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. ONORBIT, THE LOSS OF VERNIER RCS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 938 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/1R MDAC ID: 939

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 4 & F5, RJDF

5) DIODE

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 4 (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. ONORBIT, THE LOSS OF VERNIER RCS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 940 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/1R MDAC ID: 941

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 4 & F5, RJDF

5) DIODE

6)

7) 8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/1R
3/3	TAL:	3/1R
3/2R	AOA:	3/1R
3/3	ATO:	3/1R
3/3		
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 4 (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. ONORBIT, THE LOSS OF VERNIER RCS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 942 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- DIODE
- 6)
- 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. SHORTED DIODE MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2
MDAC ID: 943 ABORT: 1/1

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

1/19/87 DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 944 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		= / ~

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1CR25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE HAS NO IMPACT ON POWER TO MANIFOLD DRIVER CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

2/2 FLIGHT: SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 945

DIODE ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER TO VERNIER JET MANIFOLD F5 DRIVER POWER CIRCUIT. LOSS OF F5R AND F5L VERNIER JETS WILL RESULT IN LOSS OF VERNIER RCS ATTITUDE CONTROL.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: MDAC ID: 946 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- DIODE 5)
- 6) 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1CR31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

SHORTED DIODE HAS NO IMPACT ON POWER TO MANIFOLD DRIVER CIRCUIT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 947 ABORT: 1/1

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	1/1	
LIFTOFF:	3/3	TAL:	2/2	
ONORBIT:	2/2	AOA:	2/2	
DEORBIT:	2/2	ATO:	2/2	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16 J4-86 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 948 ABORT: 3/3

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
2/2	AOA:	3/3
3/3	ATO:	3/3
: 3/3		•
	3/3 3/3 2/2 3/3	3/3 RTLS: 3/3 TAL: 2/2 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16 J4-86 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 949

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17 J4-87 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2

MDAC ID: 950 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) DRIVER, HYBRID

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17 J4-87 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 951 ABORT: 2/1R

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 3, LCA 3

PART NUMBER: 83V76A18 J4-87 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 952 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
: 3/3		•
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 3, LCA 3

PART NUMBER: 83V76Al8 J4-87 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/2R SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 953

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- ELECTRICAL COMPONENTS
- 2) CONTROLS
 3) THRUSTER SUBSYSTEM
 4) MANIFOLD 3, RJDF
- 5) DRIVER, HYBRID

6) 7)

8)

9)

CRITICALITIES

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FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/2R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 2/1R 3/2R 3/2R 3/2R

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16J4-114

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2
MDAC ID: 954 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

CRITICALITIES

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FLIGHT PHASE PRELAUNCH:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	,
LANDING/SAFING:	3/3	AIO;	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16J4-114

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

HIGHEST CRITICALITY HDW/FUNC

1/19/87 DATE: FLIGHT: 2/2 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 955

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

SUBSYS LEAD: D.J. PAUL LEAD ANALYST: R.A. O'DONNELL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & 5, RJDF
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

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FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, LCA 3

PART NUMBER: 83V76A18 J4-86 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE: POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS

FLIGHT: 2/2 MDAC ID: 956 ABORT: 1/1

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT RTLS:	HDW/FUNC
LIFTOFF:	3/3	TAL:	1/1 2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT: LANDING/SAFING:	2/2 3/3	ATO:	2/2
= ==== 0, 0.11 1110.	J / J		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, LCA 3

PART NUMBER: 83V76A18 J4-86 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 957

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL

SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5F, RJDF
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3, LCA 3

PART NUMBER: 83V76A18 J8-111 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER TO VERNIER JET MANIFOLD F5 DRIVER POWER CIRCUIT. LOSS OF F5R AND F5L VERNIER JETS WILL RESULT IN LOSS OF VERNIER RCS ATTITUDE CONTROL.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 958 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5F, RJDF
- 5) DRIVER, HYBRID
- 6)
- 7) 8).
- 9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B[] C[]

LOCATION: F BAY 3, LCA 3

PART NUMBER: 83V76A18 J8-111 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

POWER SUPPLIED TO VERNIER JET MANIFOLD F5 (JETS F5R AND F5L) DRIVER POWER CIRCUIT. FAILURE MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 959

FUSE, 2A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 1, RJDF

5) FUSE, 2A

6) 7)

8) 9)

### CRITICALITIES

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14F12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE: FUSE FAILING OPEN WILL INHIBIT PWR TRANSFER FOR F1 MANIFOLD (4 JETS) DRIVER CIRCUITS, AND FOR 1 OF 2 REDUNDANT POWER SOURCES FOR F3 MANIFOLD (4 JETS) DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING ABORTS, THE LOSS OF F1 MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. ABORT CRITICALITY FOR FUSE OPEN IS 3/3 SINCE THE POWER LATCHING RELAY IS CLOSED PRIOR TO LIFTOFF (OPS-9). FUSE CRITICALITY WILL BE REFLECTED BY THE LATCHING RELAY FAIL ON OR OFF.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 960 ABORT: 1/1

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) FUSE, 1A
- 6)
- 7)
- 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		, –

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14F11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 2/1R ABORT: 961 MDAC ID:

FUSE, 1A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS 2)

3) THRUSTER SUBSYSTEM

4) MANIFOLD 1, RJDF

5) FUSE, 1A

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14F10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 962

ITEM: FUSE, 2A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) FUSE, 2A

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 015 S7 PART NUMBER: 33V73A15F3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FUSE FAILING OPEN WILL INHIBIT PWR TRANSFER FOR F2 MANIFOLD (4 JETS) DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT FLIGHT PHASE. DURING ABORTS, THE LOSS OF F2 MANIFOLD (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. ABORT CRITICALITY FOR FUSE OPEN IS 3/3 SINCE THE POWER LATCHING RELAY IS CLOSED PRIOR TO LIFTOFF (OPS-9). FUSE CRITICALITY WILL BE REFLECTED BY THE LATCHING RELAY FAIL ON OR OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: 963 MDAC ID:

FUSE, 1A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 2, RJDF 5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/2 2/2 2/2
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

PNL 015 S7 LOCATION: PART NUMBER: 33V73A15F2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/2R

MDAC ID: 964 ABORT: 2/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 2, RJDF

5) FUSE, 1A

6)

7) 8)

9)

### CRITICALITIES

FLIGHT PHASE	777577 / TOO		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	· <del>-</del>	
	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	•
ONORBIT:	•	TWT	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R		
	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		-,
	J/ J		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 015 S7 PART NUMBER: 33V73A15F1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 965 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 3 & 4, RJDF

5) FUSE, 1A

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 016 S6 PART NUMBER: 33V76A16F9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

FUSE FAILING OPEN WILL INHIBIT PWR TRANSFER FOR F4 MANIFOLD (2 JETS) DRIVER CIRCUITS, AND FOR 1 OF 2 REDUNDANT POWER SOURCES FOR F3 MANIFOLD (4 JETS) DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING ABORTS, THE LOSS OF F4 MANIFOLD (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. ABORT CRITICALITY FOR FUSE OPEN IS 3/3 SINCE THE POWER LATCHING RELAY IS CLOSED PRIOR TO LIFTOFF (OPS-9). FUSE CRITICALITY WILL BE REFLECTED BY THE LATCHING RELAY FAIL ON OR OFF.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 966 ABORT: 1/1

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:			-/-

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 016 S6 PART NUMBER: 33V76A16F8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS ARE NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE: FLIGHT: 3/2R

SUBSYSTEM: FRCS 2/1R ABORT: MDAC ID: 967

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF

5) FUSE, 1A

6) 7)

8)

9)

### CRITICALITIES

ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 2/1R 3/2R 3/2R 3/2R
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 016 S5 PART NUMBER: 33V76A16F6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 ABORT: 3/3 MDAC ID: 968

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
  4) MANIFOLD 4 & 5F, RJDF
  5) FUSE, 1A
- 6)
- 7) 8)
- 9)

### CRITICALITIES

<b></b>			
FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC 3/3 3/3	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3
ONORBIT: DEORBIT: LANDING/SAFING:	2/2 3/3 3/3	AOA: ATO:	3/3 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 016 S15 PART NUMBER: 33V76A16F15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

LOSS OF POWER TO VERNIER JET MANIFOLD F5 DRIVER POWER CIRCUIT. LOSS OF F5R AND F5L VERNIER JETS WILL RESULT IN LOSS OF VERNIER RCS ATTITUDE CONTROL.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

3/2R FLIGHT: SUBSYSTEM: FRCS 3/1R ABORT: MDAC ID: 969

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- FUSE, 1A

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 016 S12 PART NUMBER: 33V76A16F7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 4 (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. ONORBIT, THE LOSS OF VERNIER RCS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 970 ABORT: 1/1

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- FUSE, 1A 5)

6)

7) 8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	1/1	
LIFTOFF:	3/3	TAL:	2/2	
ONORBIT:	2/2	AOA:	2/2	
DEORBIT:	2/2	ATO:	2/2	
LANDING/SAFING	: 3/3		•	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 016 S13 PART NUMBER: 33V76A16F10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSS OF POWER SOURCE TO MANIFOLD DRIVER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF THE MANIFOLD (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: 1/1
SUBSYSTEM: FRCS
MDAC ID: 971 FLIGHT: 2/2 ABORT: 3/3

FUSE, 1A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- 5) FUSE, 1A
- 6)
- 7)
- 8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 016 S15 PART NUMBER: 33V76A16F14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSS OF POWER TO VERNIER JET MANIFOLD F5 DRIVER POWER CIRCUIT. LOSS OF F5R AND F5L VERNIER JETS WILL RESULT IN LOSS OF VERNIER RCS ATTITUDE CONTROL.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 972 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1 & 3, RJDF
- 5) RELAY
- 6)
- 7)
- 8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22K11

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LATCHING RELAY FAILING OPEN WILL REMOVE POWER FROM F1 MANIFOLD (4 JETS) DRIVER CIRCUITS, AND REMOVE 1 OF 2 REDUNDANT POWER SOURCES FROM F3 MANIFOLD (4 JETS) DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF F1 MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRIMARY JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 973

RELAY ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1 & 3, RJDF 5) RELAY
- 6)
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		·	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22K11

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LATCHING RELAY FAILING CLOSED, WILL APPLY MN-A POWER TO THE RPC'S WHICH CONTROL POWER TO F1 AND F3 MANIFOLD DRIVER CIRCUITS. NO EFFECT, SINCE POWER CAN STILL BE CONTROLLED BY THE CORRESPONDING F1 AND F3 DRIVER SWITCHES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 974 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RELAY
- 6)
- 7)
- 8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23K13

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LATCHING RELAY FAILING OPEN WILL REMOVE POWER FROM F2 MANIFOLD (4 JETS) DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF F2 MANIFOLD (4 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWR RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 975

RELAY ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- THRUSTER SUBSYSTEM 3)
- 4) MANIFOLD 2, RJDF
- RELAY 5)
- 6)
- 7) 8)
- 9)

CRITICALITIES

	A1/T + T A1		
PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
DEORBIT: LANDING/SAFING:	•	AIO.	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23K13

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LATCHING RELAY FAILING CLOSED, WILL APPLY MN-B POWER TO THE RPC WHICH CONTROLS POWER TO F2 MANIFOLD DRIVER CIRCUITS. NO EFFECT, SINCE POWER CAN STILL BE CONTROLLED BY THE F2 DRIVER SWITCH.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 976 ABORT: 1/1

ITEM: RELAY, LATCHING

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3 & 4, RJDF
- 5) RELAY, LATCHING

6)

7) 8)

9)

### CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		2/2

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 3A, PCA 3

PART NUMBER: 83V76A24K6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

LATCHING RELAY FAILING OPEN WILL REMOVE POWER FROM F4 MANIFOLD (2 JETS) DRIVER CIRCUITS, AND REMOVE 1 OF 2 REDUNDANT POWER SOURCES FROM F3 MANIFOLD (4 JETS) DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, THE LOSS OF F4 MANIFOLD (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 977

RELAY, LATCHING ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
  4) MANIFOLD 3 & 4, RJDF
- 5) RELAY, LATCHING

6)

7) 8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 3A, PCA 3

PART NUMBER: 83V76A24K6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LATCHING RELAY FAILING CLOSED, WILL APPLY MN-C POWER TO THE RPC'S WHICH CONTROL POWER TO F3 AND F4 MANIFOLD DRIVER CIRCUITS. NO EFFECT, SINCE POWER CAN STILL BE CONTROLLED BY THE CORRESPONDING F3 AND F4 DRIVER SWITCHES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 978

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R72

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 979 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

### CRITICALITIES

	V1/1 1 2 V1.00 1 0 0 0			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		-	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22A1R72

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 980

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
  3) THRUSTER SUBSYSTEM
  4) MANIFOLD 1, RJDF
- 5) RESISTOR, 5.1K 1/4W

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J1-107

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 981 MDAC ID:

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEOPRIT:	HDW/FUNC	ABORT	3/3
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
	3/3	ATO:	3/3
DEORBIT: LANDING/SAFING	3/3 : 3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J1-107

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 982 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 1.8K 1/4W

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 983

RESISTOR, 1.8K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- RESISTOR, 1.8K 1/4W 5)
- 6)
- 7)
- 8)
- 9)

# CRITICALITIES

	CKTITCKDITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
	•	RTLS:	3/3
PRELAUNCH:	3/3	<b></b>	•
LIFTOFF:	3/3	TAL:	3/3
	•	AOA:	3/3
ONORBIT:	3/3	• • • • • • • • • • • • • • • • • • • •	•
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		
TWINDTING OUT THE	, 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 984

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

FLIGHT: 3/3 ABORT: 3/3 DATE: SUBSYSTEM: FRCS MDAC ID: 985

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF 5) RESISTOR, 2.2K 1/2W

6)

7) 8)

9)

CRITICALITIES

	CKITICA	1111111	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
TISTA D T 71/0\ D 110 T T 11/0\	•		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS MDAC ID:

986

FLIGHT: ABORT:

3/3 3/3

ITEM:

RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 1.8K 1/4W

6)

7) 8)

9)

CRITICALITIES

<b>==</b> =			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	•
LANDING/SAFING:	3/3	AIO.	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 987

RESISTOR, 1.8K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 1.8K 1/4W

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
	3/3	AOA:	3/3
ONORBIT:	- <b>/</b>	ATO:	3/3
DEORBIT:	3/3	AIO.	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 988 ABORT: 2/1R

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 1.2K 2W

6)

7) 8)

9)

#### CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3	-3	٠, ــ.

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R79

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC

1/19/87 DATE: FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 989

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF 5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)
- 9)

## CRITICALITIES

	CRITICALITIES		
FLIGHT PHASE  PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	•		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R79

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

DATE: 1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT:
ABORT: 3/3 MDAC ID: 990 3/3

ITEM:

RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

CRITICALITIES

<del></del>			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:		nio.	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R73

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 991

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS

- 2) CONTROLS
  3) THRUSTER SUBSYSTEM
  4) MANIFOLD 1, RJDF
  5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R73

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 992 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22A1R81

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 993 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7)8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22A1R81

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 994 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
G: 3/3		•
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2
PART NUMBER: 82V76A23A1R12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 995

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

CRITICALITIES

	CRITICALLILLO		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 996

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

CRITICALITIES

TT T 4:50			
FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC	ABORT RTLS:	HDW/FUNC 3/3
ONORBIT:	3/3 3/3	TAL: AOA:	3/3 3/3
DEORBIT: LANDING/SAFING:	3/3 3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A17R J1-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 997

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF 5) RESISTOR, 5.1K 1/4W
- 6) 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A17R J1-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 998

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: 1/3 SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 999

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
  3) THRUSTER SUBSYSTEM
  4) MANIFOLD 2, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7) 8) 9)

CRITICALITIES

	CKITICMHITTING		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ · · ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS MDAC ID:

1000

FLIGHT: ABORT:

3/2R 2/1R

ITEM:

RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITTCALITTES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		J/ 210

REDUNDANCY SCREENS: A [ 2 ] B [ F ] . . C [ P ]

LOCATION: F BAY 2, PCA 2

PART NUMBER: 82V76A23A1R87

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

IF THE LATCHING DIODE OR RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DURING RTLS, LOSS OF MANIFOLD (4 JETS FOR F1, 2, OR 3, AND 2 JETS FOR F4) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1001

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)

9)

	CRITICALITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
	3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R87

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1002 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1003

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1004

RESISTOR, 1.8K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 2, RJDF
- RESISTOR, 1.8K 1/4W 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1005

RESISTOR, 1.8K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- RESISTOR, 1.8K 1/4W 5)

6) 7)

8) 9)

CRITICALITIES

	Q1/2 2 2		
PRELAUNCH:	HDW/FUNC	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3
LIFTOFF: ONORBIT:	3/3 3/3	AOA:	3/3
DEORBIT: LANDING/SAFING:	3/3 3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 1006 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 1.8K 1/4W

6)

7) 8)

9)

#### CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2
PART NUMBER: 82V76A23A1R77

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1007

RESISTOR, 1.8K 1/4W

ITEM: FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 1.8K 1/4W

6) 7)

8)

9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	IDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R77

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1008 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RESISTOR, 2.2K 1/2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC	
3/3	RTLS:	3/3	
3/3	TAL:	3/3	
3/3	AOA:	3/3	
3/3	ATO:	3/3	
3/3		., -	
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1009

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
  3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF 5) RESISTOR, 2.2K 1/2W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23A1R42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1010

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3 & 4, RJDF 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

#### CRITICALITIES

	~		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1011

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS

- 2) CONTROLS
  3) THRUSTER SUBSYSTEM
  4) MANIFOLD 3 & 4, RJDF
  5) RESISTOR, 5.1K 1/4W
- 6) 7)
- 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1012

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF
- RESISTOR, 5.1K 1/4W 5)

6)

7)

8) 9)

#### CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3 PART NUMBER: 83V76A18R J1-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1013

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3 PART NUMBER: 83V76A18R J1-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1014 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7)

8) 9)

CRITICALITIES

~			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

DATE: 1/3
SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1015

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC
TLS: 3/3
AL: 3/3
DA: 3/3
ro: 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1016 ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

41/2 2 2 41.02 2 2 20			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1R76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT.

DURING RTLS, LOSS OF MANIFOLD 3 (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1017

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS

- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF 5) RESISTOR, 1.2K 2W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC

OPERATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1018 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.8K 1/4W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1R72

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF.
THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND
PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT
OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1019

ITEM:

RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF 5) RESISTOR, 1.8K 1/4W

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R72

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1020 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.8K 1/4W

6)

7)

8) 9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1R70

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1021

RESISTOR, 1.8K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.8K 1/4W
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
	•	AOA:	3/3
ONORBIT:	3/3	ATO:	3/3
DEORBIT:	3/3	AIO.	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R70

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS

FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1022

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF 5) RESISTOR, 2.2K 1/2W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R39

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1023

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF 5) RESISTOR, 2.2K 1/2W

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R39

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1024 3/3 ABORT:

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C [-].

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1025

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1026

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 2.2K 1/2W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		~

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 81V76A22A1R96

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1027

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
 2) CONTROLS
 3) THRUSTER SUBSYSTEM

- 4) MANIFOLD 3, RJDF 5) RESISTOR, 2.2K 1/2W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 81V76A22A1R96

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM:FRCSFLIGHT:3/2RMDAC ID:1028ABORT:3/1R

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22A1R98

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT.

DURING RTLS, LOSS OF MANIFOLD 3 (4 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1029

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)

9)

CRITICALITIES

			
FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
ONORBIT: DEORBIT: LANDING/SAFING:	3/3	AOA:	3/3
	3/3	ATO:	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R98

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1030

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- RESISTOR, 5.1K 1/4W 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R95

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1031

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS

- 2) CONTROLS
 3) THRUSTER SUBSYSTEM
 4) MANIFOLD 3, RJDF
 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE F PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
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REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R95

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1032 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.8K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R97

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1033

RESISTOR, 1.8K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RESISTOR, 1.8K 1/4W
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

BORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R97

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1034 ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3	33234	J/ 210

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R89

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT.

DURING RTLS, LOSS OF MANIFOLD 4 (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. ONORBIT, THE LOSS OF VERNIER RCS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

DATE: 1/3 SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1035

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF 5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R89

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R ABORT: 3/1R SUBSYSTEM: FRCS MDAC ID: 1036

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

	O1/1 1 1 O1	1 1 011111 1 1 1 1 1 1	
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R75

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

IF THE LATCHING RESISTOR FAILS OPEN, AND THE LOGIC POWER INPUT FUSE OR DIODE FAILS OPEN, LOSS OF MANIFOLD LOGIC AND DRIVER POWER WILL RESULT. OTHER PRIMARY MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. FORWARD JETS NOT USED IN DEORBIT. DURING RTLS, LOSS OF MANIFOLD 4 (2 JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT WEIGHT TO MEET THE CG SAFETY BOUNDARIES. MANIFOLD CRITICALITY WILL BE DETERMINED BY 1 OR 2 LATCHING DIODE/RESISTOR CIRCUITS. ONORBIT, THE LOSS OF VERNIER RCS. INCREASE IN ABORT (TAL, AOA, ATO) AND DEORBIT FWD RCS FUEL DUMP TIME. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

DATE: 1/3
SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1037

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF 5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R75

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: MDAC ID: 1038 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 4 & F5, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3 PART NUMBER: 83V76A24A1R7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 1039 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
•	RTLS:	3/3
,	TAL:	3/3
•	AOA:	3/3
3/3	ATO:	3/3
: 3/3		
	,	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3
PART NUMBER: 83V76A24A1R7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 1040 ABORT: MDAC ID: 3/3

ITEM:

RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- RESISTOR, 1.8K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3

PART NUMBER: 83V76A24A1R69

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3

MDAC ID: 1041

RESISTOR, 1.8K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- 5) RESISTOR, 1.8K 1/4W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R69

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1042 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF
- 5) RESISTOR, 2.2K 1/2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		,
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R38

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1043

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4 & F5, RJDF 5) RESISTOR, 2.2K 1/2W
- 6) 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R38

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1044

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

VIII - VI			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3 PART NUMBER: 83V76A18R J1-107

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1045

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 4, RJDF
- 5) RESISTOR, 5.1K 1/4W
- 6) 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	•			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3 PART NUMBER: 83V76A18R J1-107

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1046 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 4, RJDF
- RESISTOR, 2.2K 1/2W 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R40

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1047

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- 5) RESISTOR, 2.2K 1/2W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R40

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE: THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1048 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- 5) RESISTOR, 1.8K 1/4W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R71

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 1049 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4, RJDF
- 5) RESISTOR, 1.8K 1/4W
- 6)
- 7)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1R71

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1050 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5F, RJDF
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3
PART NUMBER: 83V76A18R J8-82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87 FLIGHT: 3/3

SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1051

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5F, RJDF 5) RESISTOR, 5.1K 1/4W
- 6) 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, LCA 3 PART NUMBER: 83V76A18R J8-82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1052

ITEM: RESISTOR, 2.2K 1/2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- RESISTOR, 2.2K 1/2W 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R90

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1053

RESISTOR, 2.2K 1/2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF 5) RESISTOR, 2.2K 1/2W
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R90

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1054 ABORT: 3/3

ITEM: RESISTOR, 5.1K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD F5, RJDF
- 5) RESISTOR, 5.1K 2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R88

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: 1/3 SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1055

RESISTOR, 5.1K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF 5) RESISTOR, 5.1K 2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R88

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE MDM (OF) SHOULD RESPOND TO POWER ON/OFF CYCLES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1056 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- 5) RESISTOR, 1.8K 1/4W
- 6) 7)
- 8)
- ø)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3
PART NUMBER: 83V76A24A1R91

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THE OF MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO OF MDM WITH INPUT CIRCUIT OFF.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1057

RESISTOR, 1.8K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD F5, RJDF
- RESISTOR, 1.8K 1/4W 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

	CT/T T T CT/T T T T T T T T T T T T T T		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
	3/3	AOA:	3/3
ONORBIT:	,	ATO:	3/3
DEORBIT:	3/3	AIO.	3, 3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 3A, PCA 3 PART NUMBER: 83V76A24A1R91

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSS OF POWER "ON" INDICATION TO OF MDM INSTRUMENTATION.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1058 ABORT: 3/3

ITEM: RJDF1B F1 MANIFOLD DRIVER SWITCH FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- RJDF1B F1 MANIFOLD DRIVER SWITCH

6)

7)

8) 9)

CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE F1 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. POWER CAN BE REMOVED FROM RJDF BUS A ONLY BY REMOVING POWER FROM MAIN BUS A. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS A.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1059 ABORT: 1/1

ITEM: RJDF1B F1 MANIFOLD DRIVER SWITCH FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH

6)

7)

8) 9)

CRITICALITIES

4.12 4 2 4 1 4 1			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THERE IS NO REDUNDANCY LOSS OF DRIVER POWER OR POWER TO RJDF BUS A. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDF BUS A, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP. FAILURE DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1060 ABORT: 3/3

ITEM: RJDF1B F1 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER F1 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F1 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE F1 MANIFOLD, AND MAY AFFECT ONORBIT OPERATIONS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1061 ABORT: 1/1

ITEM: RJDF1B F1 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THERE IS NO REDUNDANCY LOSS OF DRIVER POWER. FAILURE WILL RESULT IN THE LOSS OF MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS. FAILURE DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1062 ABORT: 3/3

ITEM: RJDF1B F1 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

6)

7) 8)

9)

CRITICALITIES

~			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1063

RJDF1B F1 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4 ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

CVTIICU		
HDW/FUNC	ABORT RTLS:	HDW/FUNC 3/3 3/3
3/3 3/3	AOA: ATO:	3/3 3/3
. 3/3		
	HDW/FUNC 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1064 ABORT: 3/3

ITEM: RJDF1B F1 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER F1 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F1 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE F1 MANIFOLD, AND MAY AFFECT ONORBIT OPERATIONS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1065

RJDF1B F1 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6 ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- THRUSTER SUBSYSTEM 3)
- MANIFOLD 1, RJDF
- RJDF1B F1 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
	RTLS:	3/3
•	TAL:	2/3
•	AOA:	3/3
	••	3/3
•	AIO.	5,5
3/3		
	HDW/FUNC 3/3 3/3 2/2 2/2 2/2 3/3	3/3 RTLS: 3/3 TAL: 2/2 AOA: 2/2 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL THE SWITCH IS PLACED IN THE OFF POSITION. THERE IS NO REDUNDANCY LOSS OF POWER TO RJDF BUS A. FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDF BUS A, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1066 ABORT: 3/3

RJDF1B F1 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8 ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

6)

7) 8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
3/3		., -
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [.2] B [P] C [P]

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER F1 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F1 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE F1 MANIFOLD, AND MAY AFFECT ONORBIT OPERATIONS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1067 ABORT: 3/3

ITEM: RJDF1B F1 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	2/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S8 PART NUMBER: 33V73A14S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL SWITCH IS PLACED IN THE OFF POSITION. THERE IS NO REDUNDANCY LOSS OF POWER TO RJDF BUS A. FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDF BUS A, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1068

ITEM: RJDF1B F1 MANIFOLD LOGIC SWITCH FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD LOGIC SWITCH

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F1 LOGIC SWITCH ON CONTACTS, BY PLACING THE F1 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS A. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F1 MANIFOLD DRIVER POWER. AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS ABORT: 1/1 MDAC ID: 1069

RJDF1B F1 MANIFOLD LOGIC SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF 5) RJDF1B F1 MANIFOLD LOGIC SWITCH

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC AND DRIVER POWER TO THE F1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, DEORBIT PROPELLANT DUMP, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1070 ABORT: 3/3

ITEM: RJDF1B F1 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 014 S7
PART NUMBER: 33V73A14S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F1 LOGIC SWITCH ON CONTACTS, BY PLACING THE F1 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS A. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F1 MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1071

RJDF1B F1 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2 ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

CRITICALITIES

	Q2/2 =		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 2/2	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/2 2/2 2/2

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC AND DRIVER POWER TO THE F1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, DEORBIT PROPELLANT DUMP, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1072 ABORT: 3/3

ITEM: RJDF1B F1 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B F1 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3	33237	5,5

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1073

RJDF1B F1 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4 ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF 5) RJDF1B F1 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 014 S7 PART NUMBER: 33V73A14S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1074 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD DRIVER SWITCH FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
•	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
: 3/3		
	3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE F2 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. POWER CAN BE REMOVED FROM RJDF BUS B ONLY BY REMOVING POWER FROM MAIN BUS B. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS B.

HIGHEST CRITICALITY HDW/FUNC

DATE: FLIGHT: 2/2 SUBSYSTEM: FRCS ABORT: 1/1 MDAC ID: 1075

RJDF1A F2 MANIFOLD DRIVER SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH

6)

7) 8)

9)

CRITICALITIES

	A1/7 7 7 A1-		
PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 2/2 2/2	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/2 2/2 2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THERE IS NO REDUNDANCY LOSS OF DRIVER POWER OR POWER TO RJDF BUS B. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDF BUS B, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP FAILURE DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1076 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER F2 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F2 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE F2 MANIFOLD, AND MAY AFFECT ONORBIT OPERATIONS.

HIGHEST CRITICALITY HDW/FUNC

DATE: FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1077

RJDF1A F2 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2 ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2
- 6) 7)
- 8)
- 9)

CRITICALITIES

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THERE IS NO REDUNDANCY LOSS OF DRIVER POWER. FAILURE WILL RESULT IN THE LOSS OF MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS. FAILURE DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1078 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-/-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1079

RJDF1A F2 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4 FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED) OR OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

6) 7)

8)

9)

CRITICALITIES

	CVTTTCV		
FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC 3/3 3/3	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3
ONORBIT: DEORBIT: LANDING/SAFING:	3/3 3/3	AOA: ATO:	3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1080 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3	332 3 3	-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER F2 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F2 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE F2 MANIFOLD, AND MAY AFFECT ONORBIT OPERATIONS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2
MDAC ID: 1081 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL THE SWITCH IS PLACED IN THE OFF POSITION. THERE IS NO REDUNDANCY LOSS OF POWER TO RJDF BUS B. FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDF BUS B, AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1082 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

6)

7)8)

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER F2 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F2 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE F2 MANIFOLD, AND MAY AFFECT ONORBIT OPERATIONS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1083

RJDF1A F2 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8 ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S8 PART NUMBER: 33V73A15S8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL THE SWITCH IS PLACED IN THE OFF POSITION. THERE IS NO REDUNDANCY LOSS OF POWER TO RJDF BUS B. FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDF BUS B, AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1084

RJDF1A F2 MANIFOLD LOGIC SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD LOGIC SWITCH

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 015 S7 PART NUMBER: 33V73A15S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F2 LOGIC SWITCH ON CONTACTS, BY PLACING THE F2 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS B. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F2 MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1085

RJDF1A F2 MANIFOLD LOGIC SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD LOGIC SWITCH

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 2/2 2/2 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUN 1/1 2/2 2/2 2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S7 PART NUMBER: 33V73A15S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC AND DRIVER POWER TO THE F2 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOS AND PTIS, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1086 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF

5) RJDF1A F2 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

6) 7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
Landing/Safing:	3/3		•	

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 015 S7 PART NUMBER: 33V73A15S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F2 LOGIC SWITCH ON CONTACTS, BY PLACING THE F2 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS B. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F2 MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2
MDAC ID: 1087 ABORT: 1/1

ITEM: RJDF1A F2 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

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8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC 3/3 3/3	ABORT RTLS: TAL:	HDW/FUNC 1/1 2/2 2/2
ONORBIT: DEORBIT: LANDING/SAFING	2/2 2/2 : 3/3	AOA: ATO:	2/2

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S7
PART NUMBER: 33V73A15S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC AND DRIVER POWER TO THE F2 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOS AND PTIS, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1088 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

6) 7)

7) 8)

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S7
PART NUMBER: 33V73A15S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 1089 ABORT: 3/3

ITEM: RJDF1A F2 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 2, RJDF
- 5) RJDF1A F2 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

6) 7)

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CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
	3/3	ATO:	3/3
DEORBIT: LANDING/SAFING:	,	ATO:	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 015 S7
PART NUMBER: 33V73A15S7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1090 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD DRIVER SWITCH FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH

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8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER PROVIDED BY PLACING THE F3 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS ABORT: 1/1 MDAC ID: 1091

RJDF2A F3 MANIFOLD DRIVER SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED FOR POWER TO RJDF BUS C BY THE F4/F5 MANIFOLD DRIVER SWITCH. THERE IS NO REDUNDANCY LOSS OF DRIVER POWER. FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND REDUNDANT POWER TO RJDF BUS C, AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMPS LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1092 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

6) 7)

7) 8)

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		. The second sec

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER PROVIDED BY PLACING THE F3 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

HIGHEST CRITICALITY HDW/FUNC

DATE: FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1093

RJDF2A F3 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2 ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

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8) 9)

CRITICALITIES

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FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 2/2 2/2 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THERE IS NO REDUNDANCY LOSS OF DRIVER POWER. FAILURE WILL RESULT IN THE LOSS OF MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS. FAILURE DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 1094 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

6)

7)

8) 9)

CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1095 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4 FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED) OR OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

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7) 8)

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S6
PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1096 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S6
PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER PROVIDED BY PLACING THE F3 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1097

RJDF2A F3 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6 ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL THE SWITCH IS PLACED IN THE OFF POSITION. REDUNDANCY TO APPLY POWER TO RJDF BUS C PROVIDED BY THE F4/F5 MANIFOLD DRIVER SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF RJDF BUS C POWER AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R ABORT: 3/3 MDAC ID: 1098

ITEM: RJDF2A F3 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF

5) RJDF2A F3 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER PROVIDED BY PLACING THE F3 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F3 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1099

RJDF2A F3 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8 ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

6) 7)

8) 9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/2R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S6 PART NUMBER: 33V73A16S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL THE SWITCH IS PLACED IN THE OFF POSITION. REDUNDANCY TO APPLY POWER TO RJDF BUS C PROVIDED BY THE F4/F5 MANIFOLD DRIVER SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF RJDF BUS C POWER AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1100 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD LOGIC SWITCH FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD LOGIC SWITCH

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FU		
HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
3/3		
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S5 PART NUMBER: 33V73A16S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F3 LOGIC SWITCH ON CONTACTS, BY PLACING THE F3 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS C. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F3 MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1101

RJDF2A F3 MANIFOLD LOGIC SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD LOGIC SWITCH

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8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 2/2 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/2 2/2 2/2
TWNDING\ 241 ING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S5 PART NUMBER: 33V73A16S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC POWER TO THE F3 MANIFOLD (AND DRIVER POWER IF THE F3 MANIFOLD DRIVER SWITCH IS PLACED IN THE OFF POSITION) AND MAY AFFECT ONORBIT OPERATIONS, DEORBIT PROPELLANT DUMP, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1102 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

6) 7)

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		√ -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S5 PART NUMBER: 33V73A16S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F3 LOGIC SWITCH ON CONTACTS, BY PLACING THE F3 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS C. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F3 MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1103

RJDF2A F3 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2 ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

6) 7)

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CRITICALITIES

	A7/4		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 2/2	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/2 2/2 2/2

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S5 PART NUMBER: 33V73A16S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC POWER TO THE F3 MANIFOLD (AND DRIVER POWER IF THE F3 MANIFOLD DRIVER SWITCH IS PLACED IN THE OFF POSITION) AND MAY AFFECT ONORBIT OPERATIONS, DEORBIT PROPELLANT DUMP, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1104 ABORT: 3/3

ITEM: RJDF2A F3 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S5 PART NUMBER: 33V73A16S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1105

RJDF2A F3 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4 ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF
- 5) RJDF2A F3 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

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PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S5 PART NUMBER: 33V73A16S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1106 ABORT: 3/3

ITEM: RJDF2B F4/F5 MANIFOLD DRIVER SWITCH FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- 5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		٠, ٠	

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER PROVIDED BY PLACING THE F4/F5 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1107

RJDF2B F4/F5 MANIFOLD DRIVER SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF 5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH

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8) 9)

CRITICALITIES

		TOO TO	HDW/FUNC
FLIGHT PHASE	HDW/FUNC	ABORT	•
	3/3	RTLS:	1/1
PRELAUNCH:	•		•
LIFTOFF:	3/3	TAL:	2/2
	2/2	AOA:	2/2
ONORBIT:	•	•••••	•
DEORBIT:	2/2	ATO:	2/2
	3/3		
LANDING/SAFING:	, 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED FOR POWER TO RJDF BUS C BY THE F4/F5 MANIFOLD DRIVER SWITCH. THERE IS NO REDUNDANCY LOSS OF DRIVER POWER. FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND REDUNDANT POWER TO RJDF BUS C, AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMPS LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1108 3/3 ABORT:

ITEM: RJDF2B F4/F5 MANIFOLD DRIVER ON SWITCH CONTACTS 1,

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- RJDF2B F4/F5 MANIFOLD DRIVER SWITCH ON CONTACTS 1. 2

6) 7)

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER PROVIDED BY PLACING THE F4/F5 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

HIGHEST CRITICALITY HDW/FUNC

DATE: FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1109

RJDF2B F4/F5 MANIFOLD DRIVER ON SWITCH CONTACTS 1, ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM 4) MANIFOLD 4/5, RJDF

5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

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FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 2/2 2/2 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/2 2/2 2/2

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

THERE IS NO REDUNDANCY LOSS OF DRIVER POWER. FAILURE WILL RESULT IN THE LOSS OF MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS. FAILURE DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1110 ABORT: 3/3

ITEM: RJDF2B F4/F5 MANIFOLD DRIVER OFF SWITCH CONTACTS 3,

4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- 5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

6) 7)

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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		-, -	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1111

RJDF2B F4/F5 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED) OR OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- 5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

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FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1112 ABORT: 3/3

ITEM: RJDF2B F4/F5 MANIFOLD DRIVER ON SWITCH CONTACTS 5,

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- RJDF2B F4/F5 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6) 7)

8)

9)

CRITTCALITIES

TT =	01/11/00	TTTTED	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER PROVIDED BY PLACING THE F4/F5 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1113

RJDF2B F4/F5 MANIFOLD DRIVER ON SWITCH CONTACTS 5, ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF 5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6)

7) 8)

9)

CRITICALITIES

	V212 V-		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL THE SWITCH IS PLACED IN THE OFF POSITION. REDUNDANCY TO APPLY POWER TO RJDF BUS C PROVIDED BY THE F3 MANIFOLD DRIVER SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF RJDF BUS C POWER AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1114 ABORT: 3/3

ITEM: RJDF2B F4/F5 MANIFOLD DRIVER OFF SWITCH CONTACTS 7,

_ . 8

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- 5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER PROVIDED BY PLACING THE F4/F5 MANIFOLD LOGIC SWITCH IN THE OFF POSITION, OR BY REMOVING POWER TO MAIN BUS C.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE POWER FROM THE F4/F5 MANIFOLD DRIVER, WHICH WILL AFFECT ONORBIT OPERATIONS, AND THE INABILITY TO REMOVE POWER TO RJDF BUS C.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1115 ABORT: 3/3

ITEM: RJDF2B F4/F5 MANIFOLD DRIVER OFF SWITCH CONTACTS 7,

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FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 4/5, RJDF

5) RJDF2B F4/F5 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

5)

7)

8) 9)

CRITTCALITIES

	O1/2 2 # O1/		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S13 PART NUMBER: 33V73A16S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE HAS NO EFFECT UNTIL THE SWITCH IS PLACED IN THE OFF POSITION. REDUNDANCY TO APPLY POWER TO RJDF BUS C PROVIDED BY THE F3 MANIFOLD DRIVER SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF RJDF BUS C POWER AND MAY AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1116 ABORT: 3/3

ITEM: RJDF2B F4/F5 MANIFOLD LOGIC SWITCH FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- 5) RJDF2B F4/F5 MANIFOLD LOGIC SWITCH

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S12 PART NUMBER: 33V73A16S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F4/F5 LOGIC SWITCH ON CONTACTS, BY PLACING THE F4/F5 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS C. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F4/F5 MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 ABORT: 1/1 SUBSYSTEM: FRCS MDAC ID: 1117

RJDF2B F4/F5 MANIFOLD LOGIC SWITCH ITEM: FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS

- 3) THRUSTER SUBSYSTEM
 4) MANIFOLD 4/5, RJDF
 5) RJDF2B F4/F5 MANIFOLD LOGIC SWITCH

7) 8)

9)

CRITICALITIES

ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/2 2/2 2/2
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S12 PART NUMBER: 33V73A16S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC POWER TO THE F4 MANIFOLD AND DRIVER POWER TO THE F4 AND F5 MANIFOLD, WILL CAUSE LOSS OF THE VERNIER RCS, WILL AFFECT ONORBIT OPERATIONS, AND DEORBIT AND ABORT PROPELLANT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1118 ABORT: 3/3

ITEM:

RJDF2B F4/F5 MANIFOLD LOGIC SWITCH ON CONTACTS 1,

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 4/5, RJDF

RJDF2B F4/F5 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠, ٥

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:

PNL 016 S12 PART NUMBER: 33V73A16S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY REMOVING CONTROL BUS POWER FROM THE F4/F5 LOGIC SWITCH ON CONTACTS, BY PLACING THE F4/F5 MANIFOLD DRIVER SWITCH IN THE OFF POSITION, OR BY REMOVING POWER FROM MAIN BUS C. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO REMOVE F4/F5 MANIFOLD DRIVER POWER, AND WILL AFFECT ONORBIT OPERATIONS AND DEORBIT PROPELLANT DUMP LENGTHS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 1/1 ABORT: MDAC ID: 1119

RJDF2B F4/F5 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2 ITEM:

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- 5) RJDF2B F4/F5 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2

7)

8) 9)

CRITICALITIES

TAL:	2/2
AOA:	2/2
ATO:	2/2

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S12 PART NUMBER: 33V73A16S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF LOGIC AND DRIVER POWER TO THE F1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, DEORBIT PROPELLANT DUMP, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE CG SAFETY BOUNDARIES.

DATE:		HIGHEST	CRITICALITY	HDW/FUNC
SUBSYSTEM:	FRCS		FLIGHT:	3/3

MDAC ID: 1120 ABORT: 3/3

ITEM: RJDF2B F4/F5 MANIFOLD LOGIC SWITCH OFF CONTACTS 3,

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF
- 5) RJDF2B F4/F5 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

6) 7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		,
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S12 PART NUMBER: 33V73A16S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE: 3/3 FLIGHT: SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1121

RJDF2B F4/F5 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, ITEM:

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF

5) RJDF2B F4/F5 MANIFOLD LOGIC SWITCH OFF CONTACTS 3, 4

6) 7)

8)

9)

	CRITICALITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S12 PART NUMBER: 33V73A16S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1122 ABORT: 3/3

ITEM: RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH

FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
-) MANIFOLD 5, RJDF
- 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L5/F5/R5, RESULTING IN LOSS OF THE VERNIER RCS, AND MAY AFFECT ONORBIT OPERATIONS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1123

RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH ITEM:

FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) THRUSTER SUBSYSTEM
- MANIFOLD 5, RJDF 4)

RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH

6) 7)

8)

9)

CRITICALITIES			
HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3	
	HDW/FUNC 3/3 3/3 3/2R 3/3	#DW/FUNC ABORT RTLS: 3/3	

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER L5/F5/R5 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F4/F5 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD DRIVER, AND WILL AFFECT ONORBIT OPERATIONS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1124 ABORT: 3/3

ITEM: RJDF2B L5/F5/R5 MANIFOLD DRIVER ON SWITCH CONTACTS

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5, RJDF
- 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		. , -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L5/F5/R5, RESULTING IN LOSS OF THE VERNIER RCS, AND MAY AFFECT ONORBIT OPERATIONS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1125

RJDF2B L5/F5/R5 MANIFOLD DRIVER ON SWITCH CONTACTS ITEM:

1, 2 OR 5, 6

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5, RJDF
- 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

CRITICALITIES

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PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	•		
DEORBIT: LANDING/SAFING:	•	ATO:	3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER L5/F5/R5 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F4/F5 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD DRIVER, AND WILL AFFECT ONORBIT OPERATIONS.

DATE: HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1126 ABORT: 3/3

ITEM: RJDF2B L5/F5/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS

3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5, RJDF
- 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		-/ -	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1127

RJDF2B L5/F5/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS ITEM:

3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5, RJDF
- 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH OFF CONTACTS 3, 4

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1128 ABORT: 3/3

ITEM: RJDF2B L5/F5/R5 MANIFOLD DRIVER ON SWITCH CONTACTS

5, 6

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5, RJDF
- 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L5/F5/R5, RESULTING IN LOSS OF THE VERNIER RCS, AND MAY AFFECT ONORBIT OPERATIONS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1129 ABORT: 3/3

ITEM: RJDF2B L5/F5/R5 MANIFOLD DRIVER ON SWITCH CONTACTS

5, 6

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) THRUSTER SUBSYSTEM

4) MANIFOLD 5, RJDF

5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH ON CONTACTS 5, 6

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7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3 ['] /2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY TO REMOVE MANIFOLD DRIVER POWER PROVIDED BY THE OTHER L5/F5/R5 MANIFOLD DRIVER SWITCH ON CONTACTS, OR BY PLACING THE F4/F5 MANIFOLD LOGIC SWITCH IN THE OFF POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD DRIVER, AND WILL AFFECT ONORBIT OPERATIONS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1130 ABORT: 3/3

ITEM: RJDF2B L5/F5/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS

3, 4 OR 7, 8

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 5, RJDF
- 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1131 3/3 ABORT:

RJDF2B L5/F5/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS ITEM:

3, 4 OR 7, 8

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS

- 3) THRUSTER SUBSYSTEM
 4) MANIFOLD 5, RJDF
 5) RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH OFF CONTACTS 7, 8

7) 8)

9)

CRITICALITIES

C1/T T T C12TT T T T T T T T T T T T T T T T T T T			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 016 S15 PART NUMBER: 33V73A16S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1132

ITEM: RJDF1B MANIFOLD F1 TRICKLE TEST

FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 1, RJDF
- 5) RJDF1B MANIFOLD F1 TRICKLE TEST

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8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	G: 3/3		٠,٠

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: GPC VIA MDM

PART NUMBER: GPC

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE FWD RCS JETS.

HIGHEST CRITICALITY HDW/FUNC

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1133

RJDF1A MANIFOLD F2 TRICKLE TEST ITEM:

FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
 4) MANIFOLD 2, RJDF
- 5) RJDF1A MANIFOLD F2 TRICKLE TEST

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7)

8) 9)

CRITICALITIES

	CKITICALITES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: GPC VIA MDM

PART NUMBER: GPC

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE FWD RCS JETS.

DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1134 ABORT: 3/3

ITEM: RJDF2A MANIFOLD F3 TRICKLE TEST

FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 3, RJDF 5) RJDF2A MANIFOLD F3 TRICKLE TEST

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: GPC VIA MDM

PART NUMBER: GPC

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE FWD RCS JETS.

HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1135 ABORT:

RJDF2B MANIFOLD F4, F5 TRICKLE TEST

FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY. ITEM:

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) MANIFOLD 4/5, RJDF 5) RJDF2B MANIFOLD F4, F5 TRICKLE TEST

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: GPC VIA MDM

PART NUMBER: GPC

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE

FWD RCS JETS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1136 ABORT: 3/3

ITEM: CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1D, F3D,

F2D, F4D

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, DOWN
- 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1D, F3D, F2D, F4D

6) 7)

8) 9)

CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, 5
ONORBIT: DEORBIT:	3/2R 3/3	TAL: AOA:	

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1551A, V42P1553A, V42P1552A, V42P1554A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

3/2R FLIGHT: SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1137

CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1D, F3D, ITEM:

F2D, F4D

FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, DOWN
- 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1D, F3D, F2D, F4D

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1551A, V42P1553A, V42P1552A, V42P1554A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL ANNOUNCE THE JET AS FAILED ON. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1138 ABORT: 3/3

ITEM: CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1F, F2F,

F3F

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, FWD
- 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1F, F2F, F3F

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT:			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1541A, V42P1542A, V42P1543A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1139 ABORT: 3/3

ITEM: CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1F, F2F,

F3F

FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, FWD
- 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1F, F2F, F3F

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7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:			

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1541A, V42P1542A, V42P1543A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL ANNOUNCE THE JET AS FAILED ON. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1140 ABORT: 3/3

ITEM: CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1L, F3L,

F2R, F4R

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, L/R

5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1L, F3L, F2R, F4R

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1544A, V42P1546A, V42P1545A, V42P1547A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1141

CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1L, F3L, ITEM:

F2R, F4R

FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE

CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM

4) THRUSTERS, L/R 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1L, F3L, F2R, F4R

6)

7)

8) 9)

CRITICALITIES

	AT/T T # A11		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:			

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1544A, V42P1546A, V42P1545A, V42P1547A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL ANNOUNCE THE JET AS FAILED ON. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1142 ABORT: 3/3

ITEM: CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1U, F2U,

F3U

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, UP
- 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F1U, F2U, F3U

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1548A, V42P1549A, V42P1550A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1143 ABORT: 3/3

ITEM: CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS Flu, F2U,

F3II

FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE

CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, UP
- 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS Flu, F2U, F3U

6)

7)

8) 9)

CRITICALITIES

	4112220		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42P1548A, V42P1549A, V42P1550A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL ANNOUNCE THE JET AS FAILED ON. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1144 ABORT: 3/3

ITEM: CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F5L, F5R

FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, L/R
- 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F5L, F5R

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42P1555A, V42P1556A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1145

CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F5L, F5R ITEM:

FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE

CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, L/R 5) CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS F5L, F5R

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42P1555A, V42P1556A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL ANNOUNCE THE JET AS FAILED ON. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1146 ABORT: 3/3

ITEM: OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1D, F2D,

F3D, F4D

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, DOWN
- 5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1D, F2D, F3D, F4D

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3	•	•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1521C THRU 28C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED LEAKING. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1147

ITEM: OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1D, F2D, F3D, F4D

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, DOWN
 5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1D, F2D, F3D, F4D

6)

7) 8)

9)

CRITICALITIES

	CVTITON		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/2R 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1521C THRU 28C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1148 ABORT: 3/3

ITEM: OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1F, F2F,

F3F

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, FWD

5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1F, F2F, F3F

6) 7)

8)

9)

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠, ٠

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1501C THRU 06C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED LEAKING. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1149

OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1F, F2F, ITEM:

F3F

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION 2)
- 3) THRUSTER SUBSYSTEM
- THRUSTERS, FWD 4)
- 5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1F, F2F, F3F

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/2R 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	,		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1501C THRU 06C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1150 ABORT: 3/3

ITEM: OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1L, F3L, F2R, F4R

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION 2)
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, L/R
- 5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1L, F3L, F2R, F4R

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1507C THRU 14C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED LEAKING. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS 1151 MDAC ID:

ITEM: OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1L, F3L, F2R, F4R

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) THRUSTER SUBSYSTEM

4) THRUSTERS, L/R 5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1L, F3L, F2R, F4R

6) 7) .

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1507C THRU 14C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1152 ABORT: 3/3

OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1U, F2U, ITEM:

F3U

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, UP

5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1U, F2U, F3U

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1515C THRU 20C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED LEAKING. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1153 ABORT: 3/3

ITEM: OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F1U, F2U,

F3U

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) THRUSTER SUBSYSTEM

4) THRUSTERS, UP

5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS Flu, F2U, F3U

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT RTLS:	HDW/FUNC 3/3
LIFTOFF: ONORBIT:	3/2R 3/2R	TAL: AOA:	3/3 3/3
DEORBIT: LANDING/SAFING:	3/3	ATO:	3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1515C THRU 20C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1154 ABORT: 3/3

ITEM: OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F5L, F5R

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, L/R
- 5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F5L, F5R

6) 7)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1529C THRU 32C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED LEAKING. CREW MAY MAKE WRONG DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1155

OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F5L, F5R ITEM:

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION 2)
- 3) THRUSTER SUBSYSTEM
- 4) THRUSTERS, L/R
- 5) OX OR FU INJECTOR TEMP SENSOR, THRUSTERS F5L, F5R

7)

8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/2R	TAL:	3/3
	3/2R	AOA:	3/3
	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20 PART NUMBER: V42T1529C THRU 32C

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1156 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, FU FWD
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•
	•		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-Q TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1157

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2)
- THERMAL CONTROL SUBSYSTEM 3)
- 4) HTR PNL A, FU FWD
- DRIVER, HYBRID 5)
- 6)
- 7)
- 8)

9)

CRITICALITIES

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-Q TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1158 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, FU LOWER
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-N TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 3/2R

MDAC ID: 1159

ABORT:

3/3

ITEM:

DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) POD

3) THERMAL CONTROL SUBSYSTEM 4) HTR PNL A, FU LOWER

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:			

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-N TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1160 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, FU UPPER
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
3/3		•
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-S TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1161 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, FU UPPER
- 5) DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-S TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1162 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX LOWER
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-M' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R
ABORT: 3/3

MDAC ID: 1163 ABORT:

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX LOWER
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-M' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1164 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX UPPER
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-R TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1165

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX UPPER
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
	•		3/3
LIFTOFF:	3/3	TAL:	•
ONORBIT:	3/2R	AOA:	3/3
	•	ATO:	3/3
DEORBIT:	3/3	AIO.	3, 3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-R TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1166 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX UPPER
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-P' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1167 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX UPPER
- 5) DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

CRITICALITIES

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1

PART NUMBER: 81V76A16AR J5-P' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1168 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, FU FWD
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
3/3		-, -
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-Q TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1169

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, FU FWD
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

	U		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-Q TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1170 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM 4) HTR PNL B, FU LOWER
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B[P] C[P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-N TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1171 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, FU LOWER
- 5) DRIVER, HYBRID

6) 7)

8)

9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
Landing/Safing:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-N TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1172 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, FU UPPER
- 5) DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-S TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1173

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM 4) HTR PNL B, FU UPPER
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-S TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1174 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, OX FWD
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-P' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/2R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1175

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, OX FWD
- DRIVER, HYBRID 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	DW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LIFTOFF: ONORBIT:	3/3 3/2R 3/3	AOA:	3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-P' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT:
ABORT: 3/2R MDAC ID: 1176 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, OX LOWER 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-M TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1177 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, OX LOWER
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8)

9)

CRITICALITIES

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-M TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT REDUNDANT HTR SYSTEM.

LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1178 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, OX UPPER
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-R' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, OX UPPER
- 5) DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
	•	AOA:	3/3
ONORBIT:	3/2R		3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17AR J5-R' TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN THE ASSOCIATED HTR BEING FAILED "ON" WHICH COULD PRODUCE A HIGHER THAN DESIRED TEMP IN FRCS. CREW SWITCH AVAILABLE TO REMOVE POWER FROM FAILED HTR CIRCUIT AND SELECT

REDUNDANT HTR SYSTEM.
LOSS OF ALL REDUNDANCY COULD PRODUCE UPPER TEMP LIMITS EXCEEDING REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

1/19/87 DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1180 ABORT: 3/3

ITEM: FUSE, 20A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, FU FWD
- 5) FUSE, 20A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22F12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1181

FUSE, 20A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- POD 2)
- THERMAL CONTROL SUBSYSTEM 3)
- 4) HTR PNL A, FU LOWER
- 5) FUSE, 20A
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22F14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1182 ABORT: 3/3

ITEM: FUSE, 20A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX FWD
- 5) FUSE, 20A
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22F13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1183

FUSE, 20A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A, OX UPPER
- FUSE, 20A 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

	CKTITCM	777777	
PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LIFTOFF: ONORBIT:	3/2R 3/3	AOA:	3/3

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22F11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1184 ABORT: 3/3

ITEM: FUSE, 20A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM 4) HTR PNL B, FU FWD
- 5) FUSE, 20A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-/ 3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23F21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1185 ABORT: 3/3

ITEM: FUSE, 20A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, FU LOWER
- 5) FUSE, 20A
- 6)
- 7)
- 8) 9)

CRITICALITIES

	Q2\4-4		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23F23

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1186 ABORT: 3/3

ITEM: FUSE, 20A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL B, OX FWD
- 5) FUSE, 20A
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23F22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS

MDAC ID: 1187

FUSE, 20A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
 4) HTR PNL B, OX UPPER
- 5) FUSE, 20A

6)

7) 8)

9)

CRITICALITIES

RTLS:	HDW/FUNC
TAL: AOA: ATO:	3/3 3/3 3/3 3/3
	TAL: AOA:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23F20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1188 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A
- 5) FUSE, 1A
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S3
PART NUMBER: 36V73A14F11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1189

FUSE, 1A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM 4) HTR SYSTEM A
- 5) FUSE, 1A
- 6)
- 7) 8)
- 9)

CRITICALITIES

	CRITICA	TITIES	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S3 PART NUMBER: 36V73A14F9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

LOSE ABILITY TO POWER HEATERS FOR ASSOCIATED HTR SYSTEM, REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 3/2R

MDAC ID:

1190

ABORT:

3/3

ITEM:

FUSE, lA FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) FUSE, 1A
- 6)
- 7)
- 8) 9)

CRITICALITIES

52 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4			
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S3 PART NUMBER: 36V73A14F10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE ABILITY TO POWER HEATERS FOR ASSOCIATED HTR SYSTEM, REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1191 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) FUSE, 1A

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S3
PART NUMBER: 36V73A14F12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 MDAC ID: 1192 ABORT:

ITEM: FUSE, 7.5A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS
- 5) FUSE, 7.5A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14F32

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 1 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1193

FUSE, 7.5A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS
- 5) FUSE, 7.5A
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14F33

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 2 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1194 ABORT: 3/3

ITEM: FUSE, 7.5A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- 5) FUSE, 7.5A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		- / -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14F34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 3 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1195

FUSE, 7.5A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) FUSE, 7.5A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14F35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 4 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 ABORT: MDAC ID: 1196 3/3

ITEM: FUSE, 7.5A FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) FUSE, 7.5A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14F36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 5 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS ABORT: MDAC ID: 1197

HEATER 90W, A & B OX LWR HTR PNL 3 ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, FU FWD
- 5) HEATER 90W, A & B OX LWR HTR PNL 3

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
- / -	AOA:	3/3
3/3	ATO:	3/3
: 3/3		
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT103

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1198 ABORT: 3/3

ITEM: HEATER 90W, A & B OX LWR HTR PNL 3

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, FU FWD
- 5) HEATER 90W, A & B OX LWR HTR PNL 3

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
Landing/Safing	: 3/3	•	•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT103

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1199 ABORT: 3/3

ITEM: HEATER 90W, A & B OX LWR HTR PNL 1

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, FU UPPER
- 5) HEATER 90W, A & B OX LWR HTR PNL 1

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT101

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1200 ABORT: 3/3

ITEM: HEATER 90W, A & B OX LWR HTR PNL 1

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- POD 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, FU UPPER
- HEATER 90W, A & B OX LWR HTR PNL 1

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		- / -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT101

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS ABORT: MDAC ID: 1201

HEATER 90W, A & B OX FWD HTR PNL 4 ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, OX FWD
- 5) HEATER 90W, A & B OX FWD HTR PNL 4

6) 7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
	RTLS:	3/3
•	TAL:	3/3
,	AOA:	3/3
3/3	ATO:	3/3
3/3		
	•	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C. [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT104

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1202 ABORT: 3/3

ITEM: HEATER 90W, A & B OX FWD HTR PNL 4

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, OX FWD
- HEATER 90W, A & B OX FWD HTR PNL 4

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P .] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT104

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1203

HEATER 90W, A & B OX LWR HTR PNL 2 ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, OX UPPER 5) HEATER 90W, A & B OX LWR HTR PNL 2

6) 7)

8) 9)

CRITICALITIES

ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT102

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1204 ABORT: 3/3

ITEM: HEATER 90W, A & B OX LWR HTR PNL 2

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, OX UPPER
- 5) HEATER 90W, A & B OX LWR HTR PNL 2

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠, ٠

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT102

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1205

HEATER 90W, A & B FU FWD HTR PNL 5 ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, FU LOWER
- 5) HEATER 90W, A & B FU FWD HTR PNL 5

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SALING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT105

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1206 ABORT: 3/3

ITEM: HEATER 90W, A & B FU FWD HTR PNL 5

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, FU LOWER
- 5) HEATER 90W, A & B FU FWD HTR PNL 5

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT105

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1207

HEATER 90W, A & B OX LWR HTR PNL 6 ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, OX LOWER
 5) HEATER 90W, A & B OX LWR HTR PNL 6
- 6) 7)
- 8) 9)

CRITICALITIES

	OT/T T T OF		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
- ·			

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1208 ABORT: 3/3

ITEM: HEATER 90W, A & B OX LWR HTR PNL 6

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR PNL A/B, OX LOWER
- 5) HEATER 90W, A & B OX LWR HTR PNL 6

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3 : 3∕3		٠,٠

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42HT106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC

1/19/87 DATE: FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1209

HEATER 20W, THRUSTER, PRIMARY, -X AXIS ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) PRIMARY MANIFOLD JETS

HEATER 20W, THRUSTER, PRIMARY, -X AXIS

7)

8) 9)

CRITICALITIES

	ウンエキエクい		
PRELAUNCH:	HDW/FUNC	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3
LIFTOFF: ONORBIT: DEORBIT:	3/3 3/2R 3/3	AOA: ATO:	3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42HRF1D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW C&W LIMITS, JETS WILL BE ANNOUNCED AS "FAILED OFF". FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPERATIONS. THE PROPELLANTS WILL NOT HAVE ENOUGH TIME TO FREEZE DURING ABORTS.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR

28JUNE85

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1210 ABORT: 3/3

ITEM: HEATER 20W, THRUSTER, PRIMARY, -X AXIS

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) PRIMARY MANIFOLD JETS
- 5) HEATER 20W, THRUSTER, PRIMARY, -X AXIS

6) 7)

8) 9)

CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42HRF1D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW C&W LIMITS, JETS WILL BE ANNOUNCE AS "FAILED OFF". FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPERATIONS. THE PROPELLANTS WILL NOT HAVE ENOUGH TIME TO FREEZE DURING ABORTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/1R SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1211

HEATER 20W, THRUSTER, PRIMARY, Y AXIS ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

THERMAL CONTROL SUBSYSTEM 3)

PRIMARY MANIFOLD JETS 4)

HEATER 20W, THRUSTER, PRIMARY, Y AXIS 5)

6)

7)

8) 9)

CRITICALITIES

LIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3
	3,

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42HRF1F

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW C&W LIMITS, JETS WILL BE ANNOUNCED AS "FAILED OFF". FAILURE MAY AFFECT ONORBIT OPERATIONS. FAILURE OF ALL REDUNDANCY MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY TO MEET CG SAFETY BOUNDARIES. THE PROPELLANTS WILL NOT HAVE ENOUGH TIME TO FREEZE DURING ABORTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 1212 ABORT: 3/3

ITEM: HEATER 20W, THRUSTER, PRIMARY, Y AXIS

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) PRIMARY MANIFOLD JETS

5) HEATER 20W, THRUSTER, PRIMARY, Y AXIS

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42HRF1F

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELIANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW C&W LIMITS, JETS WILL BE ANNOUNCED AS "FAILED OFF". FAILURE MAY AFFECT ONORBIT OPERATIONS. FAILURE OF ALL REDUNDANCY MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY TO MEET CG SAFETY BOUNDARIES. THE PROPELLANTS WILL NOT HAVE ENOUGH TIME TO FREEZE DURING ABORTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1213

HEATER 20W, THRUSTER, PRIMARY, Z AXIS ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) PRIMARY MANIFOLD JETS

5) HEATER 20W, THRUSTER, PRIMARY, Z AXIS

6) 7) 8)

9)

CRITICALITIES

HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42HRF1L

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE: REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW C&W LIMITS, JETS WILL BE ANNOUNCED AS "FAILED OFF". FAILURE OF ALL REDUNDANCY MAY AFFECT ONORBIT OPERATIONS. THE PROPELLANTS WILL NOT HAVE ENOUGH TIME TO FREEZE DURING ABORTS.

DATE: 1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT:
ABORT: 3/2R

MDAC ID: 1214

3/3

ITEM:

HEATER 20W, THRUSTER, PRIMARY, Z AXIS

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) PRIMARY MANIFOLD JETS

5) HEATER 20W, THRUSTER, PRIMARY, Z AXIS

7)

8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
3/3		٠,٠
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:

FWD FUSELAGE AREA 20

PART NUMBER: V42HRF1L

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW C&W LIMITS, JETS WILL BE ANNOUNCED AS "FAILED OFF". FAILURE OF ALL REDUNDANCY MAY AFFECT ONORBIT OPERATIONS. THE PROPELLANTS WILL NOT HAVE ENOUGH TIME TO FREEZE DURING ABORTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 2/2 SUBSYSTEM: FRCS MDAC ID: 1215 ABORT: 3/3

HEATER 10W, THRUSTER, VERNIER, ALL AXES ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) VERNIER MANIFOLD JETS 5) HEATER 10W, THRUSTER, VERNIER, ALL AXES

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42HRF5L

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO REDUNDANCY. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW THE C&W LIMITS, JET WILL BE ANNOUNCED AS "FAILED OFF". FAILURE WILL RESULT IN LOSS OF VERNIER RCS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1216 ABORT: 3/3

ITEM: HEATER 10W, THRUSTER, VERNIER, ALL AXES

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) VERNIER MANIFOLD JETS
- 5) HEATER 10W, THRUSTER, VERNIER, ALL AXES

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: V42HRF5L

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO REDUNDANCY. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW THE C&W LIMITS, JET WILL BE ANNOUNCED AS "FAILED OFF". FAILURE WILL RESULT IN LOSS OF VERNIER RCS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS ABORT: MDAC ID: 1217

RELAY ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

C7/T T T C51		
HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
•	AOA:	3/3
3/3	ATO:	3/3
: 3/3		
	HDW/FUNC 3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22K10

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR SYSTEM. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1218 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, PCA 1
PART NUMBER: 81V76A22K10

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE MAIN BUS POWER FROM THE ASSOCIATED HTR SYSTEM. NO EFFECT, HYBRID DRIVERS AND THERMOSTAT INPUTS PROVIDE PROPER ON/OFF CONTROL OF HTR SYSTEM. LOSS OF ALL REDUNDANCY CAN PRODUCE UPPER TEMP LIMITS EXCEEDING FRCS REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1219

RELAY ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM 4) HTR SYSTEM B
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE F	IDW/FUNC	ABORT	HDW/FUNC 3/3
PRELAUNCH:	3/3	RTLS:	
LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	3/3 3/2R 3/3 3/3	TAL: AOA: ATO:	3/3 3/3 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23K12

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

FAILURE CAUSES LOSS OF POWER FOR ASSOCIATED HTR SYSTEM. LOSS OF ALL REDUNDANCY WOULD RESULT IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1220 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		, -

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, PCA 2 PART NUMBER: 82V76A23K12

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE MAIN BUS POWER FROM THE ASSOCIATED HTR SYSTEM. NO EFFECT, HYBRID DRIVERS AND THERMOSTAT INPUTS PROVIDE PROPER ON/OFF CONTROL OF HTR SYSTEM. LOSS OF ALL REDUNDANCY CAN PRODUCE UPPER TEMP LIMITS EXCEEDING FRCS REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

1/19/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS MDAC ID: 1221 FLIGHT: 3/2R ABORT: 3/3

ITEM:

RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM 4) HTR SYSTEM A
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

	A7/4		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
TWNDING\ DWLING.	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J4-74

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE FU SYSTEM THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1222 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:		AIO.	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J4-74

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, HEATER SYSTEM STILL FULLY OPERATIONAL.

1/19/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 3/2R

MDAC ID: 1223

ABORT:

3/3

ITEM:

RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

	CIVITATION		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
	3/2R	AOA:	3/3
ONORBIT:	•	ATO:	3/3
DEORBIT:	3/3	AIO.	٠,٠
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J4-78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE OX SYSTEM THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3

MDAC ID: 1224 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM 4) HTR SYSTEM A
- 5) RESISTOR, 1.2K 2W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J4-78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, HEATER SYSTEM STILL FULLY OPERATIONAL.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 DATE: 1/.
SUBSYSTEM: FRCS MDAC ID: 1225

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
 4) HTR SYSTEM A
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

GHT PHASE HDW/FUNC ABORT HDW/FUNG PRELAUNCH: 3/3 RTLS: 3/3 LIFTOFF: 3/3 TAL: 3/3	C
ONORBIT: 3/3 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3	
NMO.	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE FRCS HTR SWITCH POSITION TALKBACK. NO EFFECT, SWITCH POSITION CAN BE INDIRECTLY DETERMINED BY MONITORING HTR SYSTEM OPERATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1226 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT	HDW/FUNC
LIFTOFF:	•	RTLS:	3/3
ONORBIT:	3/3	TAL:	3/3
· · · - · - · - ·	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, PCA 1 PART NUMBER: 81V76A22A1R78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, TALKBACK STILL AVAILABLE TO GPC.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 DATE: 1/.
SUBSYSTEM: FRCS MDAC ID: 1227

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- THERMAL CONTROL SUBSYSTEM
 4) HTR SYSTEM A
- 5) RESISTOR, 1.2K 2W

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
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REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J4-82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, TALKBACK STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO D01

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1228 ABORT: 3/3

ITEM:

RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 1, LCA 1 PART NUMBER: 81V76A16R J4-82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, TALKBACK STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1229

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
 5) RESISTOR, 1.2K 2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

	A1/T 7 T A1		
FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT RTLS:	HDW/FUNC
LIFTOFF: ONORBIT:	3/3 3/3	TAL: AOA:	3/3 3/3
DEORBIT: LANDING/SAFING:	3/3 3/3	ATO:	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A17R J4-82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, TALKBACK STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1230 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		-, -
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A17R J4-82

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, TALKBACK STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 3/2R ABORT: 3/3

MDAC ID: 1231

ITEM:

RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) RESISTOR, 1.2K 2W

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	•		·

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: F BAY 2, LCA 2

PART NUMBER: 82V76A17R J4-78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE OX SYSTEM THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM, REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3

MDAC ID: 1232 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) RESISTOR, 1.2K 2W

6)

7) 8) .

9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		3, 3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A17R J4-78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, HEATER SYSTEM STILL FULLY OPERATIONAL.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS ABORT: MDAC ID: 1233

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) RESISTOR, 5.1K 1/4W

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC 3/3 3/3	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3 3/3
ONORBIT: DEORBIT: LANDING/SAFING:	3/3 3/3 3/3	AOA: ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A23A1R18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE FRCS HTR SWITCH POSITION TALKBACK. NO EFFECT, SWITCH POSITION CAN BE INDIRECTLY DETERMINED BY MONITORING HTR SYSTEM OPERATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1234 ABORT: 3/3

ITEM: RESIST

RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) RESISTOR, 5.1K 1/4W
- 6) 7)
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3	====	٠, ٥

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A23A1R18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, TALKBACK STILL AVAILABLE TO GPC.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R ABORT: 3/3 DATE: 1/2 SUBSYSTEM: FRCS MDAC ID: 1235

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) RESISTOR, 1.2K 2W

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A17R J4-74

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE FU SYSTEM THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM, REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1236 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM B
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

#### CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: F BAY 2, LCA 2 PART NUMBER: 82V76A17R J4-74

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, HEATER SYSTEM STILL FULLY OPERATIONAL.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1237

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
  4) MANIFOLD 1 JETS
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8) 9)

CRITICALITIES

RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	TAL: AOA:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14-A2R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE GPC TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 1" SWITCH POSITION. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL.

REFERENCES: VS70-942099 REV D EO D01; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1238 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14-A2R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

NO EFFECT, TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 1" SWITCH POSITION IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1239

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8) 9)

CRITICALITIES

	C7/* 7 * C0 *		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
	•	TAL:	3/3
LIFTOFF:	3/3		•
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14-A3R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE GPC TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 2" SWITCH POSITION. NO EFFECT, THERMÓSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL.

REFERENCES: VS70-942099 REV D EO D01; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1240 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM 4) MANIFOLD 2 JETS
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		٠,٠

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14-A3R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT, TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 2" SWITCH POSITION IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1241

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM 4) MANIFOLD 3 JETS
- 5) RESISTOR, 5.1K 1/4W

6) 7)

8) 9)

CRITICALITIES

	CVTTTCU	111111		
FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT RTLS:	HDW/FUNC	
LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	3/3 3/3 3/3 3/3	TAL: AOA: ATO:	3/3 3/3 3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S16
PART NUMBER: 36V73A14-A4R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE GPC TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 3" SWITCH POSITION. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3
MDAC ID: 1242 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

# CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		5/5

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S16
PART NUMBER: 36V73A14-A4R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

NO EFFECT, TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 3" SWITCH POSITION IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1243

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM 4) MANIFOLD 4 JETS
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
	3/3	AOA:	3/3
ONORBIT:	*	ATO:	3/3
DEORBIT:	3/3	AIO.	•/ •
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ .]. C [ ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14-A5R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE GPC TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 4" SWITCH POSITION. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1244 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3	***************************************	-, 5

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14-A5R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT, TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 4" SWITCH POSITION IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1245

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14-A6R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE GPC TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 5" SWITCH POSITION. NO EFFECT, THERMÓSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1246 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM4) MANIFOLD 5 JETS
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14-A6R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

NO EFFECT, TALKBACK FOR "RCS/OMS HEATERS FWD RCS JET 5" SWITCH POSITION IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

1/19/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 3/2R ABORT: 3/3

MDAC ID: 1247

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS

ITEM: FAILURE MODE: FAILS TO SWITCH (STUCK IN A-AUTO POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) POD

3) THERMAL CONTROL SUBSYSTEM

4) HTR SYSTEM A/B, OX

5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS

6)

7) 8)

9)

#### CRITICALITIES

ABORT	HDW/FUNC
RTLS: TAL: AOA: ATO:	3/3 3/3 3/3 3/3 3/3
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S3 PART NUMBER: 36V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE POWER FROM HEATER SYSTEM. HEATER SYSTEM THERMOSTATS ARE STILL AVAILABLE TO MAINTAIN PROPER THERMAL CONTROL. LOSS OF ALL REDUNDANCY CAN PRODUCE UPPER TEMP LIMITS EXCEEDING FRCS REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 20923 PCN-1

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1248 ABORT: 3/3

ITEM: SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS

FAILURE MODE: FAILS TO SWITCH (STUCK IN B-AUTO POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A/B, OX
- 5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS

6)

7)

8) 9)

## CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		-/ -	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S3
PART NUMBER: 36V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE POWER FROM HEATER SYSTEM. HEATER SYSTEM THERMOSTATS ARE STILL AVAILABLE TO MAINTAIN PROPER THERMAL CONTROL. LOSS OF ALL REDUNDANCY CAN PRODUCE UPPER TEMP LIMITS EXCEEDING FRCS REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 20923 PCN-1

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 3/2R ABORT: 3/3

MDAC ID: 1249

ABORT:

ITEM:

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS FAILURE MODE: FAILS TO SWITCH (STUCK IN OFF POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A/B, OX

5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS

6)

7)

8) 9)

#### CRITICALITIES

	U1/4 U1/		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S3

PART NUMBER: 36V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE THERMOSTAT CONTROL FOR ASSOCIATED HEATER SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 20923 PCN-1

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 1250 ABORT: 3/1R

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH

FAILURE MODE: SWITCH FAILS IN THE ON POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS
- 5) MANIFOLD 1, JETS HEATER CONTROL SWITCH

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		= / == 1

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 2/2 ABORT: 3/3

MDAC ID: 1251

MANIFOLD 1, JETS HEATER CONTROL SWITCH

TITEM: MANIFOLD 1, JETS HEATER CONTROL OF FAILURE MODE: SWITCH FAILS IN THE OFF POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS

5) MANIFOLD 1, JETS HEATER CONTROL SWITCH

6) 7)

8) 9)

CRITICALITIES

ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1252 ABORT: 3/3

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH ON CONTACTS

1, 2 FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS
- 5) MANIFOLD 1, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2
- 6) 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		5/5

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE: FLIGHT: 3/1R

SUBSYSTEM: FRCS 3/1R ABORT: MDAC ID: 1253

MANIFOLD 1, JETS HEATER CONTROL SWITCH ON CONTACTS ITEM:

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS

5) MANIFOLD 1, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

7)

8) 9)

CRITICALITIES

CVT T T CUTT T T T T T T T T T T T T T T T			
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/1R 3/1R	ABORT RTLS: TAL: AOA:	HDW/FUNC 3/1R 3/1R 3/1R
DEORBIT: LANDING/SAFING:	3/1R	ATO:	3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD CAUSE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1254 ABORT: 3/3

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH OFF

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS
- 5) MANIFOLD 1, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

6) 7)

8)

9)

#### CRITICALITIES

DW/FUNC
3/3
3/3
3/3
3/3
-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC 1/13/87

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1255

MANIFOLD 1, JETS HEATER CONTROL SWITCH OFF ITEM:

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM 4) MANIFOLD 1 JETS
- 5) MANIFOLD 1, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

6) 7)

8)

9)

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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS MDAC ID:

1256

FLIGHT: ABORT:

3/2R 3/3

ITEM:

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 1 FAILURE MODE: FAILS TO SWITCH (FAILS IN AUTO POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS
- 5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 1

6)

7) 8)

9)

# CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT RTLS:	HDW/FUNC 3/3
LIFTOFF: ONORBIT:	3/3 3/2R	TAL: AOA:	3/3 3/3
DEORBIT: LANDING/SAFING:	3/3 3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

PNL A14 S14

PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE POWER FROM THE FRCS JET 1 HTR SYSTEM. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL. LOSS OF ALL REDUNDANCY RESULTS IN JET 1 HEATERS AND REDUNDANT JET HEATERS FAILED "ON" CAUSING LOSS OF ASSOCIATED HEATERS, THEREFORE LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

2/2 FLIGHT: SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1257

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 1 ITEM:

FAILURE MODE: FAILS TO SWITCH (FAILS IN OFF POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 1 JETS

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 1

6) 7)

8) 9)

CRITICALITIES

	CRITICA	TTITES	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S14 PART NUMBER: 36V73A14S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 1 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO D01; JSC 18549 150CT82 LTR

28JUNE85

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 1258 ABORT: 3/1R

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH

FAILURE MODE: SWITCH FAILS IN THE ON POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS
- 5) MANIFOLD 2, JETS HEATER CONTROL SWITCH

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/1R
3/1R	TAL:	3/1R
3/1R	AOA:	3/1R
3/1R	ATO:	3/1R
3/3		,
	3/3 3/1R 3/1R 3/1R	3/3 RTLS: 3/1R TAL: 3/1R AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

PNL A14 S15 LOCATION: PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 2/2 ABORT: 3/3 SUBSYSTEM: FRCS MDAC ID: 1259

MANIFOLD 2, JETS HEATER CONTROL SWITCH ITEM:

FAILURE MODE: SWITCH FAILS IN THE OFF POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS
- 5) MANIFOLD 2, JETS HEATER CONTROL SWITCH

6) 7)

8) 9)

#### CRITICALITIES

CVTTTCU	TTTTT	
HDW/FUNC 3/3 3/3 2/2 2/2	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
3/3		
	HDW/FUNC 3/3 3/3 2/2 2/2	3/3 RTLS: 3/3 TAL: 2/2 AOA: 2/2 ATO:

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS

FLIGHT: 2/2 MDAC ID: 1260 ABORT: 3/3

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS
- 5) MANIFOLD 2, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2
- 6) 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE: FLIGHT: 3/1R

SUBSYSTEM: FRCS ABORT: 3/1R MDAC ID: 1261

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH ON CONTACTS

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) MANIFOLD 2 JETS

5) MANIFOLD 2, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD CAUSE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1262 ABORT: 3/3

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH OFF

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS
- 5) MANIFOLD 2, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

7)

8)

9)

#### CRITICALITIES

4-14-5-7-41-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

DATE: 1/.
SUBSYSTEM: FRCS FLIGHT: 3/3 3/3 ABORT: MDAC ID: 1263

MANIFOLD 2, JETS HEATER CONTROL SWITCH OFF ITEM:

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS 5) MANIFOLD 2, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
	3/3	ATO:	3/3
DEORBIT: LANDING/SAFING:	= /	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1264 ABORT: 3/3

ITEM: SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 2

FAILURE MODE: FAILS TO SWITCH (FAILS IN AUTO POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS
- 5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 2

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
Landing/Safing	: 3/3		-, -

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE POWER FROM THE FRCS JET 2 HTR SYSTEM. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL. LOSS OF ALL REDUNDANCY RESULTS IN JET 1 HEATERS AND REDUNDANT JET HEATERS FAILED "ON" CAUSING LOSS OF ASSOCIATED HEATERS, THEREFORE LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1265

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 2 ITEM:

FAILURE MODE: FAILS TO SWITCH (FAILS IN OFF POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 2 JETS

5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 2

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S15 PART NUMBER: 36V73A14S15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 2 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO D01; JSC 18549 150CT82 LTR 28JUNE85

DATE: 1/13/87

HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 1266 ABORT: 3/1R

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH

FAILURE MODE: SWITCH FAILS IN THE ON POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- MANIFOLD 3, JETS HEATER CONTROL SWITCH

6)

7)

8) 9)

CRITICALITIES

PRELAUNCH: LIFTOFF:	HDW/FUNC 3/3 3/1R	ABORT RTLS: TAL:	HDW/FUNC 3/1R 3/1R
ONORBIT: DEORBIT: LANDING/SAFING:	3/1R 3/1R 3/3	AOA: ATO:	3/1R 3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1267

MANIFOLD 3, JETS HEATER CONTROL SWITCH ITEM:

FAILURE MODE: SWITCH FAILS IN THE OFF POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- 5) MANIFOLD 3, JETS HEATER CONTROL SWITCH

7)

8)

9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 2/2 LANDING/SAFING: 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1268 ABORT: 3/3

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH ON CONTACTS

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- 5) MANIFOLD 3, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING	: 3/3		3, 3

REDUNDANCY SCREENS: A [ ] B [ ] C [

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE: FLIGHT: 3/1R

SUBSYSTEM: FRCS 3/1R ABORT: MDAC ID: 1269

MANIFOLD 3, JETS HEATER CONTROL SWITCH ON CONTACTS ITEM:

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) MANIFOLD 3 JETS

5) MANIFOLD 3, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

#### CRITICALITIES

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FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/1R
	3/1R	TAL:	3/1R
ONORBIT: DEORBIT: LANDING/SAFING:	3/1R	AOA:	3/1R
	3/1R	ATO:	3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD CAUSE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1270 ABORT: 3/3

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH OFF

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- 5) MANIFOLD 3, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC 1/13/87

DATE: FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1271

MANIFOLD 3, JETS HEATER CONTROL SWITCH OFF ITEM:

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- 5) MANIFOLD 3, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

	CVTTTC		
PRELAUNCH:	HDW/FUNC 3/3 3/3	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3
LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	3/3 3/3	AOA: ATO:	3/3 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS MDAC ID:

1272

FLIGHT: ABORT:

3/2R 3/3

ITEM:

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 3

FAILURE MODE: FAILS TO SWITCH (FAILS IN AUTO POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS
- SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 3

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		3/3

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

PNL Al4 S16

PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE POWER FROM THE FRCS JET 3 HTR SYSTEM. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL. LOSS OF ALL REDUNDANCY RESULTS IN JET 1 HEATERS AND REDUNDANT JET HEATERS FAILED "ON" CAUSING LOSS OF ASSOCIATED HEATERS, THEREFORE LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1273

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 3 ITEM:

FAILURE MODE: FAILS TO SWITCH (FAILS IN OFF POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 3 JETS

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 3 5)

6) 7)

8) 9)

#### CRITICALITIES

	C1/T T T C1		
PRELAUNCH: LIFTOFF:	HDW/FUNC 3/3 3/3	ABORT RTLS: TAL: AOA:	HDW/FUNC 3/3 3/3 3/3
ONORBIT: DEORBIT: LANDING/SAFING:	2/2 3/3 3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S16 PART NUMBER: 36V73A14S16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 3 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO D01; JSC 18549 150CT82 LTR 28JUNE85

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 1274 ABORT: 3/1R

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH

FAILURE MODE: SWITCH FAILS IN THE ON POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) MANIFOLD 4, JETS HEATER CONTROL SWITCH

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:			J/ 110

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S17

PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1275

MANIFOLD 4, JETS HEATER CONTROL SWITCH ITEM:

FAILURE MODE: SWITCH FAILS IN THE OFF POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
  3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) MANIFOLD 4, JETS HEATER CONTROL SWITCH

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING	•		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1276 ABORT: 3/3

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH ON CONTACTS

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) MANIFOLD 4, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

6) 7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND PROPELLANT DUMP LENGTHS FOR ENTRY.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/13/87

FLIGHT: 3/1R SUBSYSTEM: FRCS MDAC ID: 1277 3/1R ABORT:

MANIFOLD 4, JETS HEATER CONTROL SWITCH ON CONTACTS ITEM:

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) MANIFOLD 4 JETS

5) MANIFOLD 4, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

#### CRITICALITIES

	67/7 7 7 41			
FLIGHT PHASE  PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/1R 3/1R 3/1R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD CAUSE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1278 ABORT: 3/3

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH OFF

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) MANIFOLD 4, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4
- 6) 7)
- 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		- / -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/13/87

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1279

MANIFOLD 4, JETS HEATER CONTROL SWITCH OFF ITEM:

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
  3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) MANIFOLD 4, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	•		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1280 ABORT: 3/3

ITEM: SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 4

FAILURE MODE: FAILS TO SWITCH (FAILS IN AUTO POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS

5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 4

6) 7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE POWER FROM THE FRCS JET 4 HTR SYSTEM. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL. LOSS OF ALL REDUNDANCY RESULTS IN JET 1 HEATERS AND REDUNDANT JET HEATERS FAILED "ON" CAUSING LOSS OF ASSOCIATED HEATERS, THEREFORE LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1281

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 4 ITEM:

FAILURE MODE: FAILS TO SWITCH (FAILS IN OFF POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 4 JETS
- 5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 4

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S17 PART NUMBER: 36V73A14S17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 4 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO D01; JSC 18549 150CT82 LTR 28JUNE85

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R ABORT: 3/3 MDAC ID: 1282

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH

FAILURE MODE: SWITCH FAILS IN THE ON POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) MANIFOLD 5, JETS HEATER CONTROL SWITCH

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS AND LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099 REV B EO B12, CL, DL

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1283

MANIFOLD 5, JETS HEATER CONTROL SWITCH ITEM:

FAILURE MODE: SWITCH FAILS IN THE OFF POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) MANIFOLD 5, JETS HEATER CONTROL SWITCH

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	2/2	AOA:	3/3
	3/3	ATO:	3/3
DEORBIT: LANDING/SAFING:	•	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE MANIFOLD, AND WILL CAUSE LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO Bl2, CL, DL

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 2/2

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1284 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH ON CONTACTS

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) MANIFOLD 5, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD, AND WILL CAUSE LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, CL, DL

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE: FLIGHT: 3/1R

SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1285

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH ON CONTACTS

1, 2

FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

3) THERMAL CONTROL SUBSYSTEM

4) MANIFOLD 5 JETS

5) MANIFOLD 5, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2

6) 7)

8)

9)

CRITICA	LITIES
W/FUNC	ABORT

FLIGHT PHASE PRELAUNCH:	HDW/FUNC	ABORT RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS AND LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099 REV B EO B12, CL, DL

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/3 MDAC ID: 1286 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH OFF

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) MANIFOLD 5, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

6)

7) 8)

9)

## CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CL. DL

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: FRCS FLIGHT: 3/3 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH OFF

CONTACTS 3, 4

FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) MANIFOLD 5, JETS HEATER CONTROL SWITCH OFF CONTACTS 3, 4

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO Bl2, CL, DL

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

FLIGHT: SUBSYSTEM: FRCS 3/2R 3/3 MDAC ID: 1288 ABORT:

ITEM: SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 5

FAILURE MODE: FAILS TO SWITCH (FAILS IN AUTO POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS
- 5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 5

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE ABILITY TO REMOVE POWER FROM THE FRCS JET 5 HTR SYSTEM. NO EFFECT, THERMOSTATS IN SYSTEM WILL MAINTAIN PROPER THERMAL CONTROL. LOSS OF ALL REDUNDANCY RESULTS IN JET 1 HEATERS AND REDUNDANT JET HEATERS FAILED "ON" CAUSING LOSS OF ASSOCIATED HEATERS, THEREFORE LOSS OF MISSION.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85; MC467-0029 REV G AMENDMENT SEQ. 2.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1289

SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 5 ITEM:

FAILURE MODE: FAILS TO SWITCH (FAILS IN OFF POSITION)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) MANIFOLD 5 JETS

5) SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 5

6) 7)

8)

9)

#### CRITICALITIES

HDW/FUNC
LS: 3/3
L: 3/3
$A: \qquad 3/3$
0: 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S18 PART NUMBER: 36V73A14S18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF ALL MANIFOLD 5 HTRS. INABILITY TO MAINTAIN LOWER TEMPERATURE LIMIT WILL TRIGGER A CLASS 2 ALARM AND CAUSE ASSOCIATED ENGINES TO BE DESELECTED THROUGH LEAK DETECTION SOFTWARE. LOSS OF MANIFOLD ENGINES WILL RESULT IN A LOSS OF LOSS OF FULL MISSION CAPABILITIES.

REFERENCES: VS70-942099 REV D EO DO1; JSC 18549 150CT82 LTR 28JUNE85

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1290 ABORT: 3/3

ITEM: FU SYSTEM A & B THERMOSTAT

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A/B, FU
- 5) FU SYSTEM A & B THERMOSTAT

6)

7)

8) 9)

### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
3/3		•
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42TS101, 201

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1291

FU SYSTEM A & B THERMOSTAT ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A/B, FU
- 5) FU SYSTEM A & B THERMOSTAT

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42TS101, 201

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

THERMOSTAT FAILURE CAUSES THREE OUT OF THE SIX HEATERS TO BE CONTINUALLY ON. THE REDUNDANT HTR SYSTEM OR MANUAL CREW CYCLE OF SYSTEM STILL AVAILABLE. LOSS OF ALL REDUNDANCY CAN PRODUCE UPPER TEMP LIMITS EXCEEDING FRCS REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSIONS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1292 ABORT: 3/3

ITEM: OX SYSTEM A & B THERMOSTAT

FAILURE MODE: FAILS OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A/B, OX
- 5) OX SYSTEM A & B THERMOSTAT

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42TS201, 202

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE THERMOSTAT CONTROL FOR ASSOCIATED HTR SYSTEM REDUNDANT GROUP AVAILABLE. SECOND FUSE FAILURE RESULTS IN AN INABILITY TO MAINTAIN PROPELLANTS AT DESIRED TEMPERATURE AND WOULD BE CAUSE TO NO-GO FURTHER USE OF FRCS, LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: FRCS ABORT: 3/3 MDAC ID: 1293

OX SYSTEM A & B THERMOSTAT ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) POD
- 3) THERMAL CONTROL SUBSYSTEM
- 4) HTR SYSTEM A/B, OX
- OX SYSTEM A & B THERMOSTAT 5)

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
	3/2R	AOA:	3/3
ONORBIT:	•	ATO:	3/3
DEORBIT:	3/3	AIO.	3, 5
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE AREA 20

PART NUMBER: 22V42TS201, 202

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

THERMOSTAT FAILURE CAUSES THREE OUT OF THE SIX HEATERS TO BE CONTINUALLY ON. THE REDUNDANT HTR SYSTEM OR MANUAL CREW CYCLE OF SYSTEM STILL AVAILABLE. LOSS OF ALL REDUNDANCY CAN PRODUCE UPPER TEMP LIMITS EXCEEDING FRCS REDLINES CAUSING NO-GO FURTHER USE OF FRCS, LOSS OF MISSIONS.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1294 ABORT: 3/3

ITEM: THERMOSTAT, PRIMARY THRUSTERS, - X AXIS

FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) PRIMARY THRUSTERS, X AXIS
- 5) THERMOSTAT, PRIMARY THRUSTERS, X AXIS

6) 7)

8)

9)

#### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/2R	AOA:	3/3
3/3	ATO:	3/3
3/3		-, -
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: JET ASSEMBLY

PART NUMBER: V42TSF1F, F2F, F3F

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

## EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF TEMPERATURE FALLS BELOW C&W LIMITS, JETS WILL BE ANNOUNCED AS "FAILED OFF". FAILURE MAY AFFECT ONORBIT OPERATIONS.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 2/1R SUBSYSTEM: FRCS ABORT: 2/1R MDAC ID: 1295

THERMOSTAT, PRIMARY THRUSTERS, - X AXIS ITEM:

FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER 2)
- 3) THERMAL CONTROL SUBSYSTEM
- 4) PRIMARY THRUSTERS, X AXIS
- 5) THERMOSTAT, PRIMARY THRUSTERS, X AXIS

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	,		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: JET ASSEMBLY

PART NUMBER: V42TSF1F, F2F, F3F

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

### EFFECTS/RATIONALE:

CREW CAN REMOVE POWER FROM THE HEATER SWITCHES OR CAN INHIBIT THE JET FROM FIRING WITH THE DPS. HOWEVER, THE C&W DOES NOT ANNUNCIATE THIS HIGH TEMPERATURE CONDITION. FAILURE OF ALL REDUNDANCY WILL CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS AND POSSIBLE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/1R MDAC ID: 1296 ABORT: 3/3

ITEM: THERMOSTAT, PRIMARY THRUSTERS, Y AXIS

FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) PRIMARY THRUSTERS, Y AXIS
- 5) THERMOSTAT, PRIMARY THRUSTERS, Y AXIS

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: JET ASSEMBLY

PART NUMBER: V42TSF1L, F3L, F2R, F4R

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

#### EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROP WILL FREEZE IN JET. FAILURE DETECTABLE VIA JET TEMP TRANSDUCER. IF TEMP DROPS BELOW C&W LIMITS, JET WILL BE ANNOUNCED AS "FAILED OFF".

FAILURE MAY AFFECT ONORBIT OPS. FAILURE OF ALL REDUNDANCY MAY CAUSE INABILITY TO EXPEL ENOUGH PROP TO MEET CG SAFETY BOUNDARIES DURING ENTRY. PROP WILL NOT HAVE TIME TO FREEZE DURING ABORTS.

1/13/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

FLIGHT: 2/1R ABORT: 2/1R

MDAC ID:

1297

ITEM:

THERMOSTAT, PRIMARY THRUSTERS, Y AXIS

FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- PRIMARY THRUSTERS, Y AXIS

THERMOSTAT, PRIMARY THRUSTERS, Y AXIS

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: JET ASSEMBLY

PART NUMBER: V42TSF1L, F3L, F2R, F4R

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

## EFFECTS/RATIONALE:

CREW CAN REMOVE POWER FROM THE HEATER SWITCHES OR CAN INHIBIT THE JET FROM FIRING WITH THE DPS. HOWEVER, THE C&W DOES NOT ANNUNCIATE THIS HIGH TEMPERATURE CONDITION. FAILURE OF ALL REDUNDANCY WILL CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS AND POSSIBLE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 3/2R MDAC ID: 1298 ABORT: 3/3

ITEM: THERMOSTAT, PRIMARY THRUSTERS, Z AXIS

FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) PRIMARY THRUSTERS, Z AXIS
- 5) THERMOSTAT, PRIMARY THRUSTERS, Z AXIS

6)

7) 8)

ø)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: JET ASSEMBLY

PART NUMBER: V42TSF1U, F2U, F3U, F1D, F2D, F3D, F4D

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

### EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW C&W LIMITS, JETS WILL BE ANNOUNCED AS "FAILED OFF". FAILURE MAY AFFECT ONORBIT OPERATIONS. THE PROPELLANTS WILL NOT HAVE ENOUGH TIME TO FREEZE DURING ABORTS.

DATE:

1/13/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS

MDAC ID: 1299

FLIGHT: 2/1R ABORT:

2/1R

ITEM:

THERMOSTAT, PRIMARY THRUSTERS, Z AXIS

FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) PRIMARY THRUSTERS, Z AXIS
- 5) THERMOSTAT, PRIMARY THRUSTERS, Z AXIS

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: JET ASSEMBLY

PART NUMBER: V42TSF1U, F2U, F3U, F1D, F2D, F3D, F4D

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

## EFFECTS/RATIONALE:

CREW CAN REMOVE POWER FROM THE HEATER SWITCHES OR CAN INHIBIT THE JET FROM FIRING WITH THE DPS. HOWEVER, THE C&W DOES NOT ANNUNCIATE THIS HIGH TEMPERATURE CONDITION. FAILURE OF ALL REDUNDANCY WILL CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS AND POSSIBLE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: FRCS FLIGHT: 2/2 MDAC ID: 1300 ABORT: 3/3

ITEM: THERMOSTAT, VERNIER THRUSTERS, ALL AXES

FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) THRUSTER
- 3) THERMAL CONTROL SUBSYSTEM
- 4) VERNIER THRUSTERS, ALL AXES
- 5) THERMOSTAT, VERNIER THRUSTERS, ALL AXES

6)

7)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: JET ASSEMBLY PART NUMBER: V42TSF5L, F5R

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

### EFFECTS/RATIONALE:

PROPELLANTS WILL FREEZE IN THE JET. FAILURE IS DETECTABLE VIA JET TEMPERATURE TRANSDUCER. IF THE TEMPERATURE DROPS BELOW THE C&W LIMITS, JET WILL BE ANNOUNCED AS "FAILED OFF". FAILURE WILL RESULT IN LOSS OF VERNIER RCS.

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 2/1R SUBSYSTEM: FRCS 3/3 ABORT: MDAC ID: 1301

THERMOSTAT, VERNIER THRUSTERS, ALL AXES ITEM:

FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) THRUSTER

THERMAL CONTROL SUBSYSTEM

VERNIER THRUSTERS, ALL AXES

THERMOSTAT, VERNIER THRUSTERS, ALL AXES 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: JET ASSEMBLY PART NUMBER: V42TSF5L, F5R

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

## EFFECTS/RATIONALE:

CREW CAN REMOVE POWER FROM THE HEATER SWITCHES OR CAN INHIBIT THE JET FROM FIRING WITH THE DPS. HOWEVER, THE C&W DOES NOT ANNUNCIATE THIS HIGH TEMPERATURE CONDITION. FAILURE OF ALL REDUNDANCY WILL CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS AND POSSIBLE LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1302 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ] ...

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76Al3lRPC8; RPCl3

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS A SWITCH" TO CLOSE "OX & FU HE ISOL A VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R ABORT: 3/1R SUBSYSTEM: ARCS MDAC ID: 1303

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

#### CRITICALITIES

HASE HDW/FUNC ABORT HDW/FUNC UNCH: 3/3 RTLS: 3/1R FF: 3/3 TAL: 3/1R IT: 3/2R AOA: 3/1R IT: 3/1R ATO: 3/1R IG/SAFING: 3/3
<del> ·</del>

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76A131RPC8; RPC13

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL A VALVES", SINCE THIS FAILURE CONSTANTLY POWERS THE VALVE CLOSE SOLENOIDS, UNLESS THE "AFT L/R RCS HE PRESS A SWITCH" IS IN OPEN POSITION. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL AFFECT ONORBIT OPERATIONS, AND MAY CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1304 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
Landing/Safing:	: 3/3		,

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76A131RPC9; RPC14

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS A SWITCH" TO CLOSE "OX & FU HE ISOL A VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1305 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) CONTROLLER, REMOTE POWER

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/1R	
LIFTOFF:	3/3	TAL:	3/1R	
ONORBIT:	3/2R	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	•			

REDUNDANCY SCREENS: A [ 3 ] · · B [ F ] C [ P ]

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76Al31RPC9; RPC14

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY TO AUTOMATICALLY INHIBIT CLOSING THE "OX & FU HE ISOL A" VALVES WHEN THEY BECOME FULLY CLOSED. HOWEVER, THE VALVES CAN STILL BE OPENED VIA GPC OR SWITCH. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY, WHICH WILL AFFECT ONORBIT OPERATIONS, AND MAY CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND THE CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1306 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) CONTROLLER, REMOTE POWER
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76Al31RPC10; RPC15

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL A VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS HE PRESS A SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

FLIGHT: 3/1R

SUBSYSTEM: ARCS MDAC ID: 1307

ABORT:

3/1R

ITEM:

CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV A
- 5) CONTROLLER, REMOTE POWER

6) 7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76A131RPC10; RPC15

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU HE ISOL A VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1308 ABORT: 3/1R

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

#### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC	
3/1R	RTLS:	3/1R	
3/1R	TAL:	3/1R	
3/1R	AOA:	3/1R	
3/1R	ATO:	3/1R	
3/3		•	
	3/1R 3/1R 3/1R 3/1R	3/1R RTLS: 3/1R TAL: 3/1R AOA: 3/1R ATO:	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

AV BAY 5, PCA 2

PART NUMBER: 55V76A132RPC10; RPC11

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS A SWITCH" TO OPEN THE "OX & FU HE ISOL A VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANK AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1309 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) CONTROLLER, REMOTE POWER

6) 7)

8) 9)

## CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 5, PCA 2

PART NUMBER: 55V76A132RPC10; RPC11

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU HE ISOL A VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANK AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1310 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76Al33RPC8; 55V76Al32RPCl3

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS B SWITCH" TO CLOSE "OX & FU HE ISOL B VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R ABORT: 3/1R SUBSYSTEM: ARCS ABORT: MDAC ID: 1311

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- CONTROLLER, REMOTE POWER

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/1R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R
LANDING/BALING.	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76A133RPC8; 55V76A132RPC13

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY TO OPEN THE "OX & FU HE ISOL B VALVES", SINCE THIS FAILURE CONSTANTLY POWERS THE VALVE CLOSE SOLENOIDS, UNLESS THE "AFT L/R RCS HE PRESS B SWITCH" IS IN OPEN POSITION. LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1312 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

## CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/1R	RTLS:	3/1R
	3/1R	TAL:	3/1R
	3/1R	AOA:	3/1R
	3/1R	ATO:	3/1R
LANDING/SAFING:		AIO.	3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C[P]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76A133RPC9; 55V76A132RPC14

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS B SWITCH" TO CLOSE "OX & FU HE ISOL B VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1313 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B

5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/1R	
LIFTOFF:	3/3	TAL:	3/1R	
ONORBIT:	3/2R	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 3 ] B [ F ] C [ P ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76A133RPC9; 55V76A132RPC14

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY TO AUTOMATICALLY INHIBIT CLOSING THE "OX & FU HE ISOL B VALVES" WHEN THEY BECOME FULLY CLOSED. HOWEVER, THE VALVES CAN STILL BE OPENED VIA GPC OR SWITCH. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1314 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76Al33RPCl3; 55V76Al32RPCl2

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL B VALVES". VALVES CAN STILL BE OPERATED BY "AFT L/R RCS HE PRESS B SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R ABORT: 3/1R SUBSYSTEM: ARCS MDAC ID: 1315

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) CONTROLLER, REMOTE POWER
- 6)
- 7) 8)
- 9)

### CRITICALITIES

	CRITICA	TUTTIO	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76A133RPC13; 55V76A132RPC12

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU HE ISOL B VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION OR COMMANDED TO CLOSE. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS MDAC ID:

1316

FLIGHT: 3/1R

ITEM:

ABORT:

3/1R

CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

CRITICALITIES

<b></b>			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		J/ IN

REDUNDANCY SCREENS: A [ 2 ] B [ P ]

C[P]

LOCATION: AV BAY 4, PCA 1; AV BAY 6, PCA3 PART NUMBER: 54V76A131RPC16; 56V76A133RPC11

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS B SWITCH" TO OPEN THE "OX & FU HE ISOL B VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1317 ABORT: 3/1R

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B

5) CONTROLLER, REMOTE POWER

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, PCA 1; AV BAY 6, PCA3 PART NUMBER: 54V76A131RPC16; 56V76A133RPC11

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU HE ISOL B VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS MDAC ID: 1318 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- DIODE 5)

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121CR J2-34; J2-24

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY FOR GPC TO CLOSE THE "OX & FU HE ISOL A VALVES". VALVES CAN STILL BE OPERATED BY "AFT L/R RCS HE PRESS A SWITCH". FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1319

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
  5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121CR J2-34; J2-24

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. MDM HAS INTERNAL PROTECTION FROM REVERSE CURRENT -

HIGH OUTPUT RESISTANCE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE

SYSTEMS HANDBOOK

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1320 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) DIODE

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	: 3/3		•

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121CR J4-25; J4-16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS A SWITCH" TO CLOSE THE "OX & FU HE ISOL A VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1321

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
  5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT RTLS:	HDW/FUNC 3/3
PRELAUNCH: LIFTOFF:	3/3 3/3	TAL:	3/3
ONORBIT: DEORBIT:	3/3 3/3	AOA: ATO:	3/3 3/3
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121CR J4-25; J4-16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

NO EFFECT. CAUSES TALKBACK TO INDICATE THE PRESENCE OF EITHER GPC OR SWITCH COMMAND TO CLOSE THE "OX & FU HE ISOL A VALVES", INSTEAD OF ONLY THE SWITCH COMMAND.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1322 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
  5) DIODE
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76A131A2CR5; A3CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL A VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS HE PRESS A SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1323 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

### CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1

PART NUMBER: 54V76Al31A2CR5; A3CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. LOSE SOME ISOLATION BETWEEN BUSES MN A AND MN B. MDM HAS INTERNAL PROTECTION FROM REVERSE CURRENT - HIGH OUTPUT RESISTANCE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1324 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) DIODE
- 6)
- 7)
- 8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76Al3lA2CR6; A3CR5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS A SWITCH" TO OPEN THE "OX & FU HE ISOL A VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1325

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
  5) DIODE
- 6)
- 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
TWINDING DELING.	3, 3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A131A2CR6; A3CR5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. LOSE SOME ISOLATION BETWEEN BUSES MN A AND MN B. MDM HAS INTERNAL PROTECTION FROM REVERSE CURRENT - HIGH OUTPUT RESISTANCE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1326 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING			J/ J

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 07 DS1; DS4

PART NUMBER: 33V73A7A2CR1, A2CR2; 33V73A7A3CR1, A3CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE OPEN OR CLOSE POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS HE PRESS A" TO INDICATE WHEN BOTH "OX & FU HE ISOL A VALVES" ARE FULLY OPEN OR CLOSED - INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 ABORT:

MDAC ID: 1327

ITEM:

DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) DIODE
- 6)
- 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3	ABORT RTLS: TAL: AOA:	HDW/FUNC 3/3 3/3 3/3	
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 07 DS1; DS4

PART NUMBER: 33V73A7A2CR1, A2CR2; 33V73A7A3CR1, A3CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1328 ABORT: 3/1R

ITEM:

DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DIODE
- 6)
- 7)
- 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	3/3		-,

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123CR J2-24 (180); 55V76A122CR J2-24 (180)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY FOR GPC TO CLOSE THE "OX & FU HE ISOL B VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS HE PRESS B SWITCH". FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1329 ABORT: 3/3

ITEM: DI

DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DIODE

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		·	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123CR J2-24 (180); 55V76A122CR J2-24 (180)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

NO EFFECT. MDM HAS INTERNAL PROTECTION FROM REVERSE CURRENT - HIGH OUTPUT RESISTANCE.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS ABORT: 3/1R MDAC ID: 1330

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- DIODE 5)
- 6)
- 7)
- 8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123CR J4-16 (181); 55V76A122CR J4-16 (181)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS B SWITCH" TO CLOSE THE "OX & FU HE ISOL B VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1331

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- DIODE 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	· .		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123CR J4-16 (181); 55V76A122CR J4-16 (181)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

NO EFFECT. CAUSES TALKBACK TO INDICATE THE PRESENCE OF EITHER GPC OR SWITCH COMMAND TO CLOSE THE "OX & FU HE ISOL B VALVES", INSTEAD OF ONLY THE SWITCH COMMAND.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1332 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:			= / ===

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76Al33A2CR16; 55V76Al32A3CR22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL B VALVES". VALVES CAN STILL BE OPERATED BY "AFT L/R RCS HE PRESS B SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/3 3/3 ABORT: MDAC ID: 1333

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV B
  5) DIODE
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76A133A2CR16; 55V76A132A3CR22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. LOSE SOME ISOLATION BETWEEN BUSES MN A AND MN B. MDM HAS INTERNAL PROTECTION FROM REVERSE CURRENT - HIGH OUTPUT RESISTANCE.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/1R ABORT: 3/1R SUBSYSTEM: ARCS MDAC ID: 1334

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- DIODE

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/1R	RTLS:	3/1R	
LIFTOFF:	3/1R	TAL:	3/1R	
ONORBIT:	3/1R	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3		·	

REDUNDANCY SCREENS: A [ 3 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76A133A2CR15; 55V76A132A3CR23

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS B SWITCH" TO OPEN THE "OX & FU HE ISOL B VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1335
ABORT: 3/3

MDAC ID: 1335

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DIODE

RESISTANCE.

- 6)
- 7)
- 8)
  - 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	•		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3; AV BAY 5, PCA 2 PART NUMBER: 56V76Al33A2CRl5; 55V76Al32A3CR23

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. LOSE SOME ISOLATION BETWEEN BUSES MN A AND MN B. MDM
HAS INTERNAL PROTECTION FROM REVERSE CURRENT - HIGH OUTPUT

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1336 ABORT: 3/3

ITEM:

DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DIODE

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 07 DS2; DS5

PART NUMBER: 33V73A7A2CR3, A2CR4; 33V73A7A3CR3, A3CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE OPEN OR CLOSE POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS HE PRESS B" TO INDICATE WHEN BOTH "OX & FU HE ISOL B VALVES" ARE FULLY OPEN OR CLOSED - INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

DATE: 1/3 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3

MDAC ID: 1337

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV B
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

	CRITICALITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 07 DS2; DS5

PART NUMBER: 33V73A7A2CR3, A2CR4; 33V73A7A3CR3, A3CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1338 FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) DRIVER, HYBRID

6) 7)

7) 8) 9)

CRITICALITIES

77 7 A.S.A			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		-/ 11

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-63 TYPE I; J6-54 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

# EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS A SWITCH" TO CLOSE "OX & FU HE ISOL A VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 2/1R SUBSYSTEM: ARCS

ABORT: 2/1R MDAC ID: 1339

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV A

5) DRIVER, HYBRID

6)

7) 8)

9)

#### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
•	RTLS:	2/1R
•	TAL:	2/1R
•	AOA:	2/1R
•	ATO:	2/1R
: 3/3		
	HDW/FUNC 3/3 3/3 3/2R 2/1R : 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 2/1R ATO:

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-63 TYPE I; J6-54 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

# EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL A VALVES", SINCE THIS FAILURE CONSTANTLY POWERS THE VALVE CLOSE SOLENOIDS, UNLESS THE "AFT L/R RCS HE PRESS A SWITCH" IS IN THE OPEN POSITION. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL AFFECT ONORBIT OPERATIONS, AND MAY CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1340 ABORT: 3/1R

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-62 TYPE I; J6-53 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS A SWITCH" TO CLOSE "OX & FU HE ISOL A VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

FLIGHT: 3/1R DATE: SUBSYSTEM: ARCS 3/1R ABORT: 1341 MDAC ID:

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) DRIVER, HYBRID

6)

7) 8) 9)

CRITICALITIES

	CRITICALITIES			
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/1R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R	

REDUNDANCY SCREENS: A [ 3 ] B [ F ] C [ P ]

AV BAY 4, LCA 1 LOCATION:

PART NUMBER: 54V76A121AR J8-62 TYPE I; J6-53 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

LOSE CAPABILITY TO AUTOMATICALLY INHIBIT CLOSING THE "OX & FU HE ISOL A" VALVES WHEN THEY BECOME FULLY CLOSED. HOWEVER, VALVE CAN STILL BE OPENED VIA SWITCH OR GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL AFFECT ONORBIT OPERATIONS, AND MAY CAUSE THE TANK LANDING WEIGHT

CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1342 ABORT: 3/1R

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- L/R HE OX & FU ISOL VLV A 4)

5) DRIVER, HYBRID

6)

7)

8) 9)

# CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/3 3/2R	ABORT RTLS: TAL: AOA:	HDW/FUNC 3/1R 3/1R 3/1R
DEORBIT:	3/1R	AOA:	3/1R
LANDING/SAFING:		ATO:	3/1R

REDUNDANCY SCREENS: A [ 2 ] B[P] C[P]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-64 TYPE I; J6-55 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

# EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL A VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS HE PRESS A SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/1R SUBSYSTEM: ARCS ABORT: 3/1R MDAC ID: 1343

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

### CRITICALITIES

	<u> </u>		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-64 TYPE I; J6-55 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

# EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU HE ISOL A VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANK AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1344 ABORT: 3/1R

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) DRIVER, HYBRID

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/1R	RTLS:	3/1R	
LIFTOFF:	3/1R	TAL:	3/1R	
ONORBIT:	3/1R	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3		-,	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 5, LCA 2

PART NUMBER: 55V76A122AR J8-65 TYPE I; J8-64 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS A SWITCH" TO OPEN THE "OX & FU HE ISOL A VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANK AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/1R SUBSYSTEM: ARCS 3/1R ABORT: MDAC ID: 1345

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
  5) DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

### CRITICALITIES

	CRITICALLILE		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 5, LCA 2

PART NUMBER: 55V76A122AR J8-65 TYPE I; J8-64 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

# EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU HE ISOL A VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANK AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1346 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) DRIVER, HYBRID

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-59 TYPE II; J8-50 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

# EFFECTS/RATIONALE:

LOSE OPEN POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS HE PRESS A" TO INDICATE WHEN BOTH "OX & FU HE ISOL A VALVES" ARE FULLY OPEN - INDICATES BARBERPOLE INSTEAD. ALSO LOSE CAPABILITY OF INHIBITING THE OPENING OF THE VALVES VIA THE SWITCH WHEN VALVES BECOME OR ARE ALREADY FULLY OPEN, BUT WILL NOT DAMAGE VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS 3/1R ABORT: MDAC ID: 1347

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV A

DRIVER, HYBRID

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
	•	ATO:	3/1R
DEORBIT:	3/1R	AIO.	J/ 110
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-59 TYPE II; J8-50 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

INHIBITS THE OPENING OF THE VALVES VIA THE "AFT L/R RCS HE PRESS A SWITCH". VALVES CAN STILL BE OPERATED BY GPC. LOSE CAPABILITY OF BARBERPOLE TALKBACK "AFT L RCS HE PRESS A" TO PROPERLY INDICATE WHEN BOTH "OX & FU HE ISOL A VALVES" ARE FULLY CLOSED. INDICATES BARBERPOLE INSTEAD. ALSO INDICATES OPEN WHEN IT SHOULD INDICATE BARBERPOLE. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVE FAILS TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1348

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) DRIVER, HYBRID

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-57 TYPE II; J8-48 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CLOSE POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS HE PRESS A" TO INDICATE WHEN BOTH "OX & FU HE ISOL A VALVES" ARE FULLY CLOSED - INDICATES BARBERPOLE INSTEAD.

ALSO LOSE CAPABILITY OF INHIBITING THE CLOSING OF THE VALVES VIA THE SWITCH WHEN VALVES BECOME OR ARE ALREADY FULLY CLOSED, BUT WILL NOT DAMAGE VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

DATE: FLIGHT: 3/1R SUBSYSTEM: ARCS 3/1R ABORT: MDAC ID: 1349

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) DRIVER, HYBRID
- 6) 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/1R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76Al2lAR J8-57 TYPE II; J8-48 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

INHIBITS THE CLOSING OF THE VALVES VIA THE "AFT L/R RCS HE PRESS A SWITCH". VALVES CAN STILL BE OPERATED BY GPC. LOSE CAPABILITY OF BARBERPOLE TALKBACK ASSOCIATED TO PROPERLY INDICATE WHEN BOTH "OX & FU HE ISOL A VALVES" ARE FULLY OPENED. INDICATES BARBERPOLE INSTEAD. ALSO INDICATES CLOSED WHEN IT SHOULD INDICATE BARBERPOLE. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN NEXT

ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

EFFECTS/RATIONALE:

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1350 ABORT: 3/1R

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		, ===

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123AR J8-54 (168) TYPE I; 55V76A122AR J8-54

TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS B SWITCH" TO CLOSE "OX & FU HE ISOL B VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

2/1R FLIGHT: SUBSYSTEM: ARCS 2/1R ABORT: MDAC ID: 1351

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV B

5) DRIVER, HYBRID

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123AR J8-54 (168) TYPE I; 55V76A122AR J8-54

TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL B VALVES", SINCE THIS FAILURE CONSTANTLY POWERS THE VALVE CLOSE SOLENOIDS, UNLESS THE "AFT L/R RCS HE PRESS B" SWITCH IS IN OPEN POSITION. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS 3/1R MDAC ID: 1352 ABORT:

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DRIVER, HYBRID

6)

7)

8) 9)

#### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC	
3/1R	RTLS:	3/1R	
3/1R	TAL:	3/1R	
3/1R	AOA:	3/1R	
3/1R	ATO:	3/1R	
: 3/3		•	
	3/1R 3/1R 3/1R 3/1R	3/1R RTLS: 3/1R TAL: 3/1R AOA: 3/1R ATO:	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123AR167 TYPE I; 55V76A122AR J8-53 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS HE PRESS B SWITCH" TO CLOSE "OX & FU HE ISOL B VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1353 ABORT: 3/1R

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 3 ] B [ F ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123AR167 TYPE I; 55V76A122AR J8-53 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY TO AUTOMATICALLY INHIBIT CLOSING THE "OX & FU HE ISOL B" VALVES WHEN THEY BECOME FULLY CLOSED. HOWEVER, VALVE CAN STILL BE OPENED VIA SWITCH OR GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE.

THIS CASE RESULTS IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1354 ABORT: 3/1R

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B

5) DRIVER, HYBRID

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123AR J8-55 (169) TYPE I; 55V76A122AR J8-55

TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU HE ISOL B VALVES". VALVES CAN STILL BE OPERATED BY "AFT L/R RCS HE PRESS B SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS

FLIGHT: 3/1R

MDAC ID: 1355

ABORT:

3/1R

ITEM:

DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	•		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2
PART NUMBER: 56V76A123AR J8-55 (169) TYPE I; 55V76A122AR J8-55

TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE: CONSTANTLY COMMANDS "OX & FU HE ISOL B VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1356 ABORT: 3/1R

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DRIVER, HYBRID

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 4, LCA 1; AV BAY 6, LCA 3

PART NUMBER: 54V76A121AR J8-65 TYPE I; 56V76A123AR J8-64 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS B SWITCH" TO OPEN THE "OX & FU HE ISOL B VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS ABORT: 3/1R MDAC ID: 1357

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DRIVER, HYBRID
- 6) 7)
- 8)
- 9)

#### CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/1R 3/1R 3/1R	ABORT RTLS: TAL: AOA:	HDW/FUNC 3/1R 3/1R 3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

AV BAY 4, LCA 1; AV BAY 6, LCA 3 LOCATION:

PART NUMBER: 54V76A121AR J8-65 TYPE I; 56V76A123AR J8-64 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU HE ISOL B VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1358 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, .

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123ARJ8-59 (165) TYPE II; 55V76A122AR J8-50

TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE OPEN POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS HE PRESS B" TO INDICATE WHEN BOTH "OX & FU HE ISOL B VALVES" ARE FULLY OPEN - INDICATES BARBERPOLE INSTEAD. ALSO LOSE CAPABILITY OF INHIBITING THE OPENING OF THE VALVES VIA THE SWITCH WHEN VALVES BECOME OR ARE ALREADY FULLY OPEN, BUT WILL NOT DAMAGE VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS 3/1R ABORT: MDAC ID: 1359

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS 2)

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV B

DRIVER, HYBRID 5)

6)

7)

8) 9)

#### CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/1R
	3/3	TAL:	3/1R
	3/2R	AOA:	3/1R
	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

B[P] C[P] REDUNDANCY SCREENS: A [ 2 ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123ARJ8-59 (165) TYPE II; 55V76A122AR J8-50

TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

INHIBITS THE OPENING OF THE VALVES VIA THE "AFT L/R RCS HE PRESS B SWITCH". VALVES CAN STILL BE OPERATED BY GPC. LOSE CAPABILITY OF BARBERPOLE TALKBACK "AFT L RCS HE PRESS B" TO PROPERLY INDICATE WHEN BOTH "OX & FU HE ISOL B VALVES" ARE FULLY CLOSED. INDICATES BARBERPOLE INSTEAD. ALSO INDICATES OPEN WHEN IT SHOULD INDICATE BARBERPOLE. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVE FAILS TO OPEN CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1360 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B

5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123AR J8-57 (164) TYPE II; 55V76A122AR J8-48

TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CLOSE POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS HE PRESS B" TO INDICATE WHEN BOTH "OX & FU HE ISOL B VALVES" ARE FULLY CLOSED - INDICATES BARBERPOLE INSTEAD. ALSO LOSE CAPABILITY OF INHIBITING THE CLOSING OF THE VALVES VIA THE SWITCH WHEN VALVES BECOME OR ARE ALREADY FULLY CLOSED, BUT WILL NOT DAMAGE VALVE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1361 ABORT: 3/1R

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV B

5) DRIVER, HYBRID

6) 7)

/) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	•		-

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123AR J8-57 (164) TYPE II; 55V76A122AR J8-48

TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

INHIBITS THE CLOSING OF THE VALVES VIA THE "AFT L/R RCS HE PRESS B SWITCH". VALVES CAN STILL BE OPERATED BY GPC. LOSE CAPABILITY OF BARBERPOLE TALKBACK "AFT L RCS HE PRESS B" TO PROPERLY INDICATE WHEN BOTH "OX & FU HE ISOL B VALVES" ARE FULLY OPENED. INDICATES BARBERPOLE INSTEAD. ALSO INDICATES CLOSED WHEN IT SHOULD INDICATE BARBERPOLE. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN NEXT ASSOCIATED FAILURE (OTHER VALVE A OR B) AFFECTING ONORBIT OPERATIONS, AND POSSIBLY CAUSING LOSS OF HELIUM PRESSURIZATION CAPABILITY. THIS LOSS WILL CAUSE THE TANK LANDING WEIGHT CONSTRAINTS AND CG SAFETY BOUNDARIES TO BE EXCEEDED DURING ENTRY OR ABORTS DUE TO TRAPPED PROPELLANT'S WEIGHT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1362 ABORT: 3/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) FUSE, 1A
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

V-1			
HDW/FUNC	ABORT	HDW/FUNC	
3/1R	RTLS:	3/1R	
3/1R	TAL:	3/1R	
3/1R	AOA:	3/1R	
3/1R	ATO:	3/1R	
3/3		·	
	3/1R 3/1R 3/1R 3/1R	3/1R RTLS: 3/1R TAL: 3/1R AOA: 3/1R ATO:	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 07 S10; PNL 07 S13

PART NUMBER: 33V73A7F1; F7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS A SWITCH" TO CLOSE THE "OX & FU HE ISOL A VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R ABORT: 3/1R SUBSYSTEM: ARCS MDAC ID: 1363

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A

5) FUSE, 1A

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/1R	RTLS:	3/1R	
LIFTOFF:	3/1R	TAL:	3/1R	
ONORBIT:	3/1R	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	•		•	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 07 S10; PNL 07 S13

PART NUMBER: 33V73A7F2; F8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS A SWITCH" TO CLOSE THE "OX & FU HE ISOL A VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1364 ABORT: 3/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) FUSE, 1A

6)

7)

8) 9)

#### CRITICALITIES

DITCUM DUACE	HDM / ETIMO	N DODE	HDW/PING
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 07 S11; PNL 07 S14

PART NUMBER: 33V73A7F3; F9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS B SWITCH" TO CLOSE THE "OX & FU HE ISOL B VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

1/19/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS

FLIGHT: 3/1R

MDAC ID: 1365

ABORT:

3/1R

ITEM:

FUSE, 1A

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV B

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R
	RTLS: TAL: AOA:

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 07 S11; PNL 07 S14

PART NUMBER: 33V73A7F4; F10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS HE PRESS B SWITCH" TO CLOSE THE "OX & FU HE ISOL B VALVES". OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE, RESULTING IN OVERPRESSURIZATION OF TANKS AND/OR LINES, AND MAY CAUSE ZOTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1366 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-35; J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "AFT L/R RCS HE PRESS A" SWITCH IN CLOSE POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "HE ISOL VLV" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1367

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-35; J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "AFT L/R RCS HE PRESS A" SWITCH IN CLOSE POSITION. LOSE VOLTAGE DIVISION TO MDM OA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1368 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-35; J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "AFT L/R RCS HE PRESS A" SWITCH IN CLOSE POSITION. LOSE VOLTAGE DIVISION TO MDM OA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: ARCS FLIGHT: 3/3

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1369

ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-35; J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "AFT L/R RCS HE PRESS A" SWITCH IN CLOSE POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "HE ISOL VLV" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1370 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2

PART NUMBER: 55V76A122R J2-37; J2-36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "AFT L/R RCS HE PRESS A" SWITCH IN OPEN POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "HE ISOL VLV" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1371

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV A
  5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2

PART NUMBER: 55V76A122R J2-37; J2-36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1372

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W

6) 7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-33; J2-23

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR "OX HE ISOL A VALVE" IN OPEN POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS ABORT: MDAC ID: 1373

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
  5) RESISTOR, 5.1K 1/4W
- 6) 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-33; J2-23

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1374 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-31; J2-21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR "OX HE ISOL A VALVE" IN CLOSED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1375

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
	3/3	ATO:	3/3
DEORBIT: LANDING/SAFING:	- ,	AIO.	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-31; J2-21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

1/19/87 HIGHEST CRITICALITY HDW/FUNC DATE:

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1376 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J8-60, 61; J8-51, 52

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE THE FOUR TALKBACKS FOR OPEN AND CLOSED POSITIONS OF BOTH "OX & FU HE ISOL A VALVES". ALSO LOSE INHIBITS TO STOP OPENING OR CLOSING VALVES WHEN THEY ARE FULLY OPENED OR CLOSED, RESPECTIVELY, BUT THIS WILL NOT DAMAGE VALVES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS ABORT: MDAC ID: 1377

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 1.2K 2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J8-60, 61; J8-51, 52

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1378 ABORT: 3/3

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-32; J2-22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR "FU HE ISOL A VALVE" IN OPENED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1379 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-32; J2-22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1380

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W

6) 7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-30; J2-20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK "FU HE ISOL A VALVE" IN CLOSED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1381

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV A
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121R J2-30; J2-20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1382 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2
PART NUMBER: 56V76A123R J2-25; 55V76A122R J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "AFT L/R RCS HE PRESS B" SWITCH IN CLOSE POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "HE ISOL VLV" TALKBACKS AND FROM BARBERPOLE INDICATOR.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

DATE: 1/1 SUBSYSTEM: ARCS FLIGHT: 3/3 3/3 ABORT: MDAC ID: 1383

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
  3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B 5) RESISTOR, 5.1K 1/4W

6)

7)

8) . 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2 PART NUMBER: 56V76A123R J2-25; 55V76A122R J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "AFT L/R RCS HE PRESS B" SWITCH IN CLOSE POSITION. LOSE VOLTAGE DIVISION TO MDM OA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 1384 ABORT: MDAC ID: 3/3

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-25 (134); 55V76A122R J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "AFT L/R RCS HE PRESS B" SWITCH IN CLOSE POSITION. LOSE VOLTAGE DIVISION TO MDM OA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

DATE: 1/1 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 ABORT: MDAC ID: 1385

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE F PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-25 (134); 55V76A122R J2-25

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "AFT L/R RCS HE PRESS B" SWITCH IN CLOSE POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "HE ISOL VLV" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1386 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W

6)

7)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		-, -	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1; AV BAY 6, LCA 3
PART NUMBER: 54V76A121R J2-37; 56V76A123R J2-36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "AFT L/R RCS HE PRESS B" SWITCH IN OPEN POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "HE ISOL VLV" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1387 ABORT: 3/3

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

	Q1/T 2 T		
FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT RTLS:	HDW/FUNC 3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1; AV BAY 6, LCA 3 PART NUMBER: 54V76A121R J2-37; 56V76A123R J2-36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1388 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

#### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC	
3/3	RTLS:	3/3	
3/3	TAL:	3/3	
3/3	AOA:	3/3	
3/3	ATO:	3/3	
3/3		•	
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-33 (129); 55V76A122R J2-23

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE TALKBACK FOR "OX HE ISOL B VALVE" IN OPEN POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1389

FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8)

9)

## CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
ONORBIT: DEORBIT: LANDING/SAFING:	3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-33 (129); 55V76A122R J2-23

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1390 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
  5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

## CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-31 (126); 55V76A122R J2-21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

LOSE TALKBACK FOR "OX HE ISOL B VALVE" IN CLOSED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE: 3/3 FLIGHT: SUBSYSTEM: ARCS 3/3 ABORT: MDAC ID: 1391

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-31 (126); 55V76A122R J2-21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1392 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ] ...

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J8-60, 61 (131); 55V76A122R J8-51, 52

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

LOSE THE FOUR TALKBACKS FOR OPEN AND CLOSED POSITIONS OF BOTH "OX & FU HE ISOL B VALVES". ALSO LOSE INHIBITS TO STOP OPENING OR CLOSING VALVES WHEN THEY ARE FULLY OPENED OR CLOSED, RESPECTIVELY, BUT THIS WILL NOT DAMAGE VALVES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1393

RESISTOR, 1.2K 2W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
  5) RESISTOR, 1.2K 2W
- 6)
- 7) 8)
- 9)

# CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J8-60, 61 (131); 55V76A122R J8-51, 52

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1394 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7) 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-32 (130); 55V76A122R J2-22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

LOSE TALKBACK FOR "FU HE ISOL B VALVE" IN OPENED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1395

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING	3/3		•	

REDUNDANCY SCREENS: A [ ] · · B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-32 (130); 55V76A122R J2-22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1396 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W

6)

7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-30 (127); 55V76A122R J2-20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

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EFFECTS/RATIONALE:

LOSE TALKBACK "FU HE ISOL B VALVE" IN CLOSED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1397

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
  4) L/R HE OX & FU ISOL VLV B
- 5) RESISTOR, 5.1K 1/4W
- 6) 7)
- 8)

9)

## CRITICALITIES

	C1/T T T C41		
PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3; AV BAY 5, LCA 2

PART NUMBER: 56V76A123R J2-30 (127); 55V76A122R J2-20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1398 ABORT: 3/1R

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH

FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B

5) L/R HE OX & FU ISOL VLV A OR B SWITCH

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		-/

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

## EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE PRESSURE REGULATOR AND THE PRESSURE RELIEF VALVE. IF THE SWITCH FAILS IN THE OPEN POSITION WHILE THE VALVE IS IN ANY POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY MDM COMMAND.

FAILURE OF ALL REDUNDANCY WILL RESULT IN THE OVERPRESSURIZATION AND RUPTURE OF THE PROPELLANT TANKS AND/OR LINES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1399 ABORT: 3/1R

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

### EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS AND THE PARALLEL ISOL VALVE. IF THE SWITCH FAILS IN THE CLOSED POSITION WHILE THE VALVE IS IN ANY POSITION, THE VALVE WILL CLOSE. IF THE MDM OPEN COMMAND IS ALSO PRESENT, OR THE SWITCH OPEN COMMAND IS ALSO PRESENT, THE VALVE WILL CYCLE OPEN AND CLOSED UNTIL THE MDM OR SWITCH OPEN COMMAND IS REMOVED, OR UNTIL THE CONTROL BUS POWER IS REMOVED FROM EITHER OF THE SWITCH'S CLOSE CONTACTS. TO OPEN THE VALVE, CREW MUST REMOVE POWER FROM EITHER OF THE SWITCH'S CLOSE CONTACTS AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPERATIONS, AND WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET TANK LANDING WEIGHT CONSTRAINTS OR CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1400 ABORT: 3/1R

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH

FAILURE MODE: SWITCH FAILS IN THE GPC POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		-,

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

# EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE PRESSURE REGULATOR AND THE PRESSURE RELIEF VALVE. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. IF THE VALVE IS CLOSED AND THE MDM COMMAND PATH FAILS, THE VALVE CANNOT BE OPENED BY THE MDM SWITCH COMMANDS. IF THE VALVE IS OPEN WHEN THE SWITCH FAILS, AND ALL REDUNDANCY FAILS, THE RESULT WILL BE OVERPRESSURIZATION AND RUPTURE OF THE PROPELLANT TANKS AND/OR LINES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1401

L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN ITEM:

CONTACTS 1, 2

FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

# BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 1, 2

6) 7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
	3/3	TAL:	3/3
LIFTOFF:	•	AOA:	3/3
ONORBIT:	3/3	ATO:	3/3
DEORBIT:	3/3	A10:	3/3
LANDING/SAFING:	3/3		
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: ARCS 3/3

FLIGHT: ABORT: MDAC ID: 1402 3/3

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN

CONTACTS 1, 2

FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

## BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 1, 2

6)

7) 8)

9)

# CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/3
SUBSYSTEM: ARCS 1/19/87 FLIGHT: 3/3

3/3 ABORT: MDAC ID: 1403

L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN ITEM:

CONTACTS 3, 4

FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B

5) L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 3, 4

6)

7)

8) 9)

CRITICALITIES

A1/2 2 2 411-1			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1404

L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN ITEM:

CONTACTS 3, 4

FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 3, 4

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

DATE:

1/19/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS

FLIGHT:

3/1R

MDAC ID:

1405

ABORT:

3/1R

ITEM:

L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE

CONTACTS 5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV A OR B

5) L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 5, 6

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM CLOSE COMMAND, THE PRESSURE REGULATOR, AND THE PRESSURE RELIEF VALVE. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY THE SWITCH OR BY THE MDM COMMAND, AND CANNOT BE CLOSED BY THE SWITCH COMMAND, ONLY BY THE MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL RESULT IN OVERPRESSURIZATION AND RUPTURE OF THE PROPELLANT TANKS AND/OR LINES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1406

L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE ITEM:

CONTACTS 5, 6

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- L/R HE OX & FU ISOL VLV A OR B 4)
- L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 5, 6

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	3: 3/3		•

REDUNDANCY SCREENS: A [2] B. [P] C [P]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS, THE OTHER SWITCH CLOSE CONTACTS, AND THE PARALLEL ISOL VALVE. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE GPC OR CLOSED POSITION, THE VALVE WILL CLOSE, AND CANNOT BE OPENED BY MDM COMMAND, ONLY BY SWITCH COMMAND. IF THE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN, AND CANNOT BE CLOSE BY MDM COMMAND, ONLY BY SWITCH COMMAND. TO OPEN THE VALVE WITH THE MDM COMMAND, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CLOSE CONTACTS 5,6, AND USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPERATIONS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY AND ABORTS TO MEET THE CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1407 ABORT: 3/1R

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN

CONTACTS 7, 8

FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 7, 8

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS AND THE PARALLEL ISOL VALVE. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE CLOSED BY SWITCH OR MDM COMMAND, BUT CANNOT BE OPENED BY SWITCH COMMAND, ONLY BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPERATIONS, AND MAY RESULT IN THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING ENTRY AND ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1408 ABORT: 3/1R

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN

CONTACTS 7, 8

FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 7, 8

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE PRESSURE REGULATOR AND THE PRESSURE RELIEF VALVE. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, OR IF THE MDM CLOSE COMMAND IS ALSO PRESENT, THE VALVE WILL CYCLE OPEN AND CLOSED UNTIL CONTROL BUS POWER TO THE OPEN OR CLOSE CONTACTS IS REMOVED, OR UNTIL THE MDM CLOSE COMMAND IS REMOVED. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE OVERPRESSURIZATION AND RUPTURE OF THE PROPELLANT TANKS AND/OR LINES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE: 3/3 FLIGHT: SUBSYSTEM: ARCS

3/3 ABORT: MDAC ID: 1409

L/R HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS ITEM:

9, 10

FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV A OR B

5) L/R HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS 9, 10

6) 7) 8) 9)

CRITICALITIES

	C1/T T T C11		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
 	3/3	TAL:	3/3
LIFTOFF:	•	AOA:	3/3
ONORBIT:	3/3	ATO:	3/3
DEORBIT:	3/3	AIO.	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE MDM OPEN COMMAND AND THE PARALLEL ISOLATION VALVE. IF THE GPC CONTACTS FAIL OPEN, THE VALVE CAN BE OPENED BY SWITCH OR MDM COMMAND, CAN BE CLOSED BY SWITCH COMMAND, AND CANNOT BE CLOSED BY MDM COMMAND UNLESS THE SWITCH IS IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL RESULT IN LOSS OF GPC CONTROL OF THE HELIUM PRESSURE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1410 ABORT: 3/1R

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS

9, 10

FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- 4) L/R HE OX & FU ISOL VLV A OR B
- 5) L/R HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS 9, 10

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		-,

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE OTHER CLOSE CONTACTS AND THE SWITCH AND MDM OPEN COMMAND. FIRST FAILURE WILL HAVE NO EFFECT. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO OPEN THE VALVE, WHICH WILL AFFECT ONORBIT OPERATIONS AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS 3/1R ABORT: MDAC ID: 1411

L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE ITEM:

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS 2)

3) HE PRESS SUBSYSTEM

L/R HE OX & FU ISOL VLV A OR B 4)

L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	: 3/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE SWITCH GPC CONTACTS AND THE MDM CLOSE COMMAND, AND BY THE PRESSURE REGULATORS AND THE PRESSURE RELIEF VALVE. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY THE SWITCH OR MDM COMMAND, BUT CANNOT BE CLOSED BY THE SWITCH OR MDM CLOSE COMMAND. THE VALVE CAN BE CLOSED BY PLACING THE SWITCH IN THE GPC POSITION, AND THEN USING THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE OVERPRESSURIZATION AND RUPTURE OF THE PROPELLANT TANKS AND/OR LINES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/1R ABORT: 3/1R SUBSYSTEM: ARCS MDAC ID: 1412

L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE ITEM:

CONTACTS 11, 12

FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) HE PRESS SUBSYSTEM
- L/R HE OX & FU ISOL VLV A OR B 4)
- L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL 07 S10

PART NUMBER: 33V73A7S10, S11; 33V73A7S13, S14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

REDUNDANCY PROVIDED BY THE OTHER SWITCH CLOSE CONTACTS AND THE PARALLEL ISOL VALVE. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, AND CAN BE CLOSED AND OPENED BY SWITCH OR MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPERATIONS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1413 ABORT: 3/1R

ITEM: L/R HE OX & FU ISOL VLV A OR B SWITCH TALKBACK

FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS

MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) INSTRUMENTATION

3) HE PRESS SUBSYSTEM

4) L/R HE OX & FU ISOL VLV A OR B

5) L/R HE OX & FU ISOL VLV A OR B SWITCH TALKBACK

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 DS1, DS2; PNL 07 DS4, DS5

PART NUMBER: 33V73A7DS1, DS2; DS4, DS5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

AFT L/R RCS HE PRESS A/B POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE A OR B VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: MDAC ID: 1414 3/3

ITEM: L/R HE OX TANK PRESS-1 PRESS SENSOR FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE OX TANK PRESS-1 PRESS SENSOR

6) 7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42PT202; 52V42PT302

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/20/87

DATE: 1/2 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1415

L/R HE OX TANK PRESS-1 PRESS SENSOR FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE OX TANK PRESS-1 PRESS SENSOR

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		
	•		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42PT202; 52V42PT302

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1416 ABORT: 3/3

ITEM: L/R HE FU TANK PRESS-1 PRESS SENSOR FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE FU TANK PRESS-1 PRESS SENSOR
- 6)
- 7)
- 8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		·
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A | B | C |]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42PT201; 52V42PT301

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK.

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/20/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1417

L/R HE FU TANK PRESS-1 PRESS SENSOR ITEM: FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE FU TANK PRESS-1 PRESS SENSOR

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS PART NUMBER: 51V42PT201; 52V42PT301

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1418 ABORT: 3/3

ITEM: L/R HE OX TANK PRESS-2 PRESS SENSOR FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE OX TANK PRESS-2 PRESS SENSOR

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42PT204; 52V42PT304

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK.

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/20/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1419

L/R HE OX TANK PRESS-2 PRESS SENSOR ITEM: FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE OX TANK PRESS-2 PRESS SENSOR

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING	3/3		·	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS PART NUMBER: 51V42PT204; 52V42PT304

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1420 ABORT: 3/3

ITEM: L/R HE FU TANK PRESS-2 PRESS SENSOR FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE FU TANK PRESS-2 PRESS SENSOR

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42PT203; 52V42PT303

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK.

CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/20/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1421

L/R HE FU TANK PRESS-2 PRESS SENSOR ITEM: FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- HE TK 4)
- L/R HE FU TANK PRESS-2 PRESS SENSOR

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		-	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42PT203; 52V42PT303

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1422 ABORT: 3/3

ITEM: L/R HE OX TANK TEMP-1 TEMP SENSOR

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE OX TANK TEMP-1 TEMP SENSOR

6) 7)

8)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT.	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42TT202; 52V42TT302

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/20/87

FLIGHT: 3/3 ABORT: 3/3 DATE: SUBSYSTEM: ARCS

MDAC ID: 1423

L/R HE OX TANK TEMP-1 TEMP SENSOR

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- INSTRUMENTATION 2)
- 3) HE PRESS SUBSYSTEM
- HE TK 4)
- L/R HE OX TANK TEMP-1 TEMP SENSOR 5)

6)

7) 8)

9)

CRITICALITIES

	CRITICA		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42TT202; 52V42TT302

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: ARCS FLIGHT: 3/3

MDAC ID: 1424 ABORT: 3/3

ITEM: L/R HE FU TANK TEMP-1 TEMP SENSOR

FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE FU TANK TEMP-1 TEMP SENSOR

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC 3/3	ABORT	HDW/FUNC
LIFTOFF:	3/3 3/3	RTLS:	3/3
ONORBIT:	3/3	TAL: AOA:	3/3
DEORBIT:	3/3	ATO:	3/3 3/3
LANDING/SAFING	3/3		3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42TT201; 52V42TT301

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1425 ABORT: 3/3

ITEM: L/R HE FU TANK TEMP-1 TEMP SENSOR

FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) INSTRUMENTATION
- 3) HE PRESS SUBSYSTEM
- 4) HE TK
- 5) L/R HE FU TANK TEMP-1 TEMP SENSOR

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS

PART NUMBER: 51V42TT201; 52V42TT301

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 ABORT: MDAC ID: 1426

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) CONTROLLER, REMOTE POWER

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 56V76A133RPC15; RPC10

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO CLOSE "OX & FU MANIFOLD 5 ISOL VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS THE VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

FLIGHT: 3/2R SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1427

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS 5) CONTROLLER, REMOTE POWER

6)

7) 8)

9)

CRITICALITIES

HDW/FUNC
3/3
3/3
3/3
3/3
·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 56V76A133RPC15; RPC10

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU MANIF 5 ISOL VALVES" SINCE THIS FAILURE CONSTANTLY POWERS THE VALVE CLOSE SOLENOIDS, UNLESS "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" IS IN OPEN POSITION. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF VRC.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

FLIGHT: 3/2R SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1428

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) CONTROLLER, REMOTE POWER

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76Al33RPCl4; RPCl2

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU MANIFOLD 5 ISOL VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS MANIFOLD 5 ISOL SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF VRCS.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1429

CONTROLLER, REMOTE POWER ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS 5) CONTROLLER, REMOTE POWER

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 56V76Al33RPC14; RPC12

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU MANIFOLD 5 ISOL VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1430 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) CONTROLLER, REMOTE POWER
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		-	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 54V76A131RPC11; RPC12

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO OPEN THE "OX & FU MANIFOLD 5 ISOL VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE, RESULTING IN LOSS OF VRCS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1431 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) CONTROLLER, REMOTE POWER

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 54V76A131RPC11; RPC12

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU MANIFOLD 5 ISOL A VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1432 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76Al16-ALL DIODES; 56V76Al16-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 28 DIODES THERE ARE 6 OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF FOUR SIGNAL PATHS TO OPEN THE OX & FU TK ISOL 1/2 VLV. LOSS OF ALL REDUNDANCY CAN CAUSE LOSS OF VEHICLE/LIFE DURING ENTRY OR ABORTS DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION).

HIGHEST CRITICALITY HDW/FUNC 1/13/87

DATE: FLIGHT: 2/1R SUBSYSTEM: ARCS 2/1R ABORT: MDAC ID: 1433

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

	CVTTTCU	112220	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/2R 3/2R 2/1R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 2/1R 2/1R 2/1R 2/1R
	•		

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6-ALL DIODES; 56V76All6-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 28 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN ONE OF THE TWO OX & FU TK ISOL 1/2 VLVS BEING STUCK PARTIALLY OPEN/CLOSED WHEN COMMANDED OPEN WHICH IS THE WORST CASE. WITH ONE VALVE FAILED MIDTRAVEL, ONE FAILURE (FAILURE TO OPEN OTHER VALVE) AWAY FROM POSSIBLE LOSS OF VEHICLE/LIFE DURING ENTRY DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION). FLOW RATE INSUFFICIENT TO SUPPORT BURN MAKES THIS PROPELLANT IN AFFECTED TANK UNUSABLE.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: ARCS FLIGHT: 3/3

MDAC ID: 1434 FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A
- 5) DIODE
- 6)
- 7)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		-/ 5

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS1; DS4

PART NUMBER: 33V73A7A2CR5, A2CR6; 33V73A7A3CR5, A3CR6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 A" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 A VALVES" ARE OPEN OR CLOSED, DEPENDING ON WHICH DIODE FAILED. INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TALKBACKS VIA GPC DISPLAY.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1435

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A
 5) DIODE
- 5)
- 6)
- 7) 8)
- 9)

CRITICALITIES

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS1; DS4

PART NUMBER: 33V73A7A2CR5, A2CR6; 33V73A7A3CR5, A3CR6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

FLIGHT: SUBSYSTEM: ARCS 3/1R MDAC ID: 1436 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A
- DIODE 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/1R
3/2R	TAL:	3/1R
3/2R	AOA:	3/1R
3/1R	ATO:	3/1R
: 3/3		-,
	3/3 3/2R 3/2R 3/1R	3/3 RTLS: 3/2R TAL: 3/2R AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 28 DIODES THERE ARE 5 OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF TWO SIGNAL PATHS TO OPEN THE OX & FU TK ISOL 3/4/5 A VLV. LOSS OF ALL REDUNDANCY CAN CAUSE LOSS OF VEHICLE/LIFE DURING ENTRY OR ABORTS DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION).

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/1R MDAC ID: 1437 FLIGHT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 A

5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/2R	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76A114-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 14 DIODES THERE ARE FOUR OF WHICH A FAILURE WOULD RESULT IN ONE OF THE TWO OX & FU TK ISOL 3/4/5 A VLVS BEING STUCK PARTIALLY OPEN/CLOSED WHEN COMMANDED OPEN WHICH IS THE WORST CASE. WITH ONE VALVE FAILED MIDTRAVEL, ONE FAILURE (FAILURE TO OPEN OTHER VALVE) AWAY FROM POSSIBLE LOSS OF VEHICLE/LIFE DURING ENTRY DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION). FLOW RATE INSUFFICIENT TO SUPPORT BURN. THIS MAKES PROPELLANT IN AFFECTED TANK UNUSABLE.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1438

ITEM:

DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS1; DS4

PART NUMBER: 33V73A7A2CR7, A2CR8; 33V73A7A3CR7, A3CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 B" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 B VALVES" ARE OPEN OR CLOSED, DEPENDING ON WHICH DIODE FAILED. INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TALKBACKS VIA GPC DISPLAY.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/21/87

DATE: 1/2 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1439

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING	: 3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS1; DS4

PART NUMBER: 33V73A7A2CR7, A2CR8; 33V73A7A3CR7, A3CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1440 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B
- 5) DIODE

6)

7)

8)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING	3: 3/3		·

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 14 DIODES THERE ARE 5 OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF TWO SIGNAL PATHS TO OPEN THE OX & FU TK ISOL 3/4/5 B VLV. LOSS OF ALL REDUNDANCY CAN CAUSE LOSS OF VEHICLE/LIFE DURING ENTRY OR ABORTS DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION).

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/1R MDAC ID: 1441 ABORT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) DIODE

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	2/1R	
LIFTOFF:	3/2R	TAL:	2/1R	
ONORBIT:	3/2R	AOA:	2/1R	
DEORBIT:	2/1R	ATO:	2/1R	
LANDING/SAFING:	•			

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A115-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 14 DIODES THERE ARE FOUR OF WHICH A FAILURE WOULD RESULT IN ONE OF THE OX & FU TK ISOL 3/4/5 B VLVS BEING STUCK PARTIALLY OPEN/CLOSED WHEN COMMANDED OPEN WHICH IS THE WORST CASE. WITH ONE VALVE FAILED MIDTRAVEL, ONE FAILURE (FAILURE TO OPEN OTHER VALVE) AWAY FROM POSSIBLE LOSS OF VEHICLE/LIFE DURING ENTRY DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION). FLOW RATE INSUFFICIENT TO SUPPORT BURN MAKES THIS PROPELLANT IN AFFECTED TANK UNUSABLE.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/13/87

3/2R SUBSYSTEM: ARCS FLIGHT: 2/1R MDAC ID: 1442 ABORT:

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- ELECTRICAL COMPONENTS
- 2) CONTROLS
- PROP STOR & DIST SUBSYSTEM
- L/R OX & FU CROSSFEED VLV 1/2
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 28 DIODES THERE ARE 6 OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF FOUR SIGNAL PATHS TO OPEN THE OX & FU TK FEED 1/2 VLVS. LOSS OF ALL REDUNDANCY IS LOSS OF MISSION DUE TO LOSS OF OMS INTERCONNECT/CROSSFEED CAPABILITY AND LOSS OF ENGINE REDUNDANCY. FIRST FAILURE DURING RTLS OR TAL, ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE DUE TO INABILITY TO DUMP OMS PROP THROUGH RCS JETS RESULTING IN POSSIBLE INABILITY TO COMPLETE TIME CRITICAL DUMP.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1443 ABORT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 28 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN ONE OF THE TWO OX & FU TK XFEED 1/2 VLVS BEING STUCK PARTIALLY OPEN/CLOSE WHEN COMMANDED OPEN WHICH IS THE WORST CASE. LOSS OF ALL REDUNDANCY IS LOSS OF MISSION DUE TO LOSS OF OMS INTERCONNECT/CROSSFEED CAPABILITY AND LOSS OF ENGINE REDUNDANCY. FIRST FAILURE DURING RTLS OR TAL, ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE DUE TO INABILITY TO DUMP OMS PROP THROUGH RCS JETS RESULTING IN POSSIBLE INABILITY TO COMPLETE TIME CRITICAL DUMP.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1444 ABORT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC	
3/3	RTLS:	2/1R	
3/3	TAL:	2/1R	
3/2R	AOA:	3/3	
3/3	ATO:	3/2R	
3/3		•	
	3/3 3/3 3/2R 3/3	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/3 ATO:	

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 4, MCA 1; AV BAY 6, MCA 3

PART NUMBER: 54V76All4-ALL DIODES; 56V76All6-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 28 DIODES THERE ARE 6 OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF FOUR SIGNAL PATHS TO OPEN THE OX & FU TK XFEED 3/4/5 VLV. LOSS OF ALL REDUNDANCY IS LOSS OF MISSION DUE TO LOSS OF OMS INTERCONNECT/CROSSFEED CAPABILITY AND LOSS OF ENGINE REDUNDANCY. FIRST FAILURE DURING RTLS OR TAL, ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE DUE TO INABILITY TO DUMP OMS PROP THROUGH RCS JETS RESULTING IN POSSIBLE INABILITY TO COMPLETE TIME CRITICAL DUMP.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1445 ABORT: 2/1R

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	2/1R	
LIFTOFF:	3/3	TAL:	2/1R	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING	3/3		•	

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 4, MCA 1; AV BAY 6, MCA 3

PART NUMBER: 54V76A114-ALL DIODES; 56V76A116-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 28 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN ONE OF THE TWO OX & FU TK XFEED 3/4/5 VLVS BEING STUCK PARTIALLY OPEN/CLOSE WHEN COMMANDED OPEN WHICH IS THE WORST CASE. LOSS OF ALL REDUNDANCY IS LOSS OF MISSION DUE TO LOSS OF OMS INTERCONNECT/CROSSFEED CAPABILITY AND LOSS OF ENGINE REDUNDANCY. FIRST FAILURE DURING RTLS OR TAL, ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE DUE TO INABILITY TO DUMP OMS PROP THROUGH RCS JETS RESULTING IN POSSIBLE INABILITY TO COMPLETE TIME CRITICAL DUMP.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/13/87

SUBSYSTEM: ARCS FLIGHT: 3/2R ABORT: 3/1R MDAC ID: 1446

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS
- DIODE 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING	: 3/3		·

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE 2 OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF TWO SIGNAL PATHS TO OPEN THE OX & FU MANIF 1 ISOL VLV. LOSS OF ALL REDUNDANCY CAN CAUSE LOSS OF VEHICLE/LIFE DURING ABORTS DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION).

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1447

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS
 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

ORT	HDW/FUNC
RTLS: TAL: AOA: ATO:	3/3 3/3 3/3 3/3
	AOA:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A115-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN FALSE TALKBACK ON THE BARBERPOLE INDICATOR.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1448 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS

5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		٠, ٠

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS13; DS18

PART NUMBER: 33V73A7A2CR9, A2CR10; 33V73A7A3CR9, A3CR10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 1 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 1 ISOL VALVES" ARE OPEN OR CLOSED, DEPENDING ON WHICH DIODE FAILED. INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1449

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS
- 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
	•	TAL:	3/3
LIFTOFF:	3/3	AOA:	3/3
ONORBIT:	3/3		•
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS13; DS18

PART NUMBER: 33V73A7A2CR9, A2CR10; 33V73A7A3CR9, A3CR10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1450 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		-,:

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76A114-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF TWO SIGNAL PATHS TO OPEN THE OX & FU MANIF 2 ISOL VLVS. LOSS OF ALL REDUNDANCY CAN CAUSE LOSS OF VEHICLE/LIFE DURING ABORTS DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION).

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1451 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN FALSE TALKBACK ON THE "AFT L/R RCS MANIF ISOL 2" BARBERPOLE INDICATOR.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/21/87

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1452

ITEM:

DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM4) MANIFOLD 2, L/R OX & FU ISOL VLVS
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS14; DS19

PART NUMBER: 33V73A7A2CR11, A2CR12; 33V73A7A3CR11, A3CR12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 2 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 2 ISOL VALVES" ARE OPEN OR CLOSED, DEPENDING ON WHICH DIODE FAILED. INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE: FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1453

ITEM:

DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS14; DS19

PART NUMBER: 33V73A7A2CR11, A2CR12; 33V73A7A3CR11, A3CR12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R

MDAC ID: 1454 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- PROP STOR & DIST SUBSYSTEM 3)
- MANIFOLD 3, L/R OX & FU ISOL VLVS 4)

5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF TWO SIGNAL PATHS TO OPEN THE OX & FU MANIF 3 ISOL VLVS. LOSS OF ALL REDUNDANCY CAN CAUSE LOSS OF VEHICLE/LIFE DURING ABORTS DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION).

HIGHEST CRITICALITY HDW/FUNC 1/13/87 DATE:

DATE: 1/3 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1455

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN FALSE TALKBACK ON THE "AFT L/R RCS MANIF ISOL 3" BARBERPOLE INDICATOR.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3

MDAC ID: 1456 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- 5) DIODE

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		5,5

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS14; DS20

PART NUMBER: 33V73A7A2CR13, A2CR14; 33V73A7A3CR13, A3CR14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 3 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 3 ISOL VALVES" ARE OPEN OR CLOSED, DEPENDING ON WHICH DIODE FAILED. INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 ABORT: MDAC ID: 1457

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- 5)
- 6)
- 7)
- 8)
- 9)

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS14; DS20

PART NUMBER: 33V73A7A2CR13, A2CR14; 33V73A7A3CR13, A3CR14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/13/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1458 ABORT: 3/1R

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		.,

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN LOSS OF ONE OF TWO SIGNAL PATHS TO OPEN THE OX & FU MANIF 4 ISOL VLVS. LOSS OF ALL REDUNDANCY CAN CAUSE LOSS OF VEHICLE/LIFE DURING ABORTS DUE TO INABILITY TO USE/DEPLETE PROPELLANT (POSSIBLE STRUCTURAL & MASS PROPERTIES VIOLATION).

HIGHEST CRITICALITY HDW/FUNC 1/13/87

DATE: FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1459

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS
- DIODE 5)
- 6)
- 7) 8)
- 9)

CRITICALITIES

	ヘンエアエクジ		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6-ALL DIODES

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

OUT OF THE 9 DIODES THERE ARE TWO OF WHICH A FAILURE WOULD RESULT IN FALSE TALKBACK ON THE "AFT L/R RCS MANIF ISOL 4" BARBERPOLE INDICATOR.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1460 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

PRELAUNCH:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT: LANDING/SAFING:	3/3 3/3	ATO:	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS15; DS21

PART NUMBER: 33V73A7A2CR15, A2CR16; 33V73A7A3CR15, A3CR16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 4 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 4 ISOL VALVES" ARE OPEN OR CLOSED, DEPENDING ON WHICH DIODE FAILED. INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1461

ITEM:

DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS15; DS21

PART NUMBER: 33V73A7A2CR15, A2CR16; 33V73A7A3CR15, A3CR16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1462 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123CR J2-44 (183); CR J2-28 (178)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO CLOSE THE "OX & FU MANIFOLD 5 ISOL VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS MANIFOLD 5 ISOL SWITCH". FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1463 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123CR J2-44 (183); CR J2-28 (178)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. MDM HAS INTERNAL PROTECTION FROM REVERSE CURRENT - HIGH OUTPUT RESISTANCE.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1464 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123CR J4-38 (182); CR J4-19 (179)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO CLOSE THE "OX & FU MANIFOLD 5 ISOL VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1465 ABORT: 3/3

ITEM: DIODE

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123CR J4-38 (182); CR J4-19 (179)

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. CAUSES TALKBACK TO INDICATE THE PRESENCE OF EITHER GPC OR SWITCH COMMAND TO CLOSE THE "OX & FU MANIFOLD 5 ISOL VALVES", INSTEAD OF ONLY THE SWITCH COMMAND.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

SUBSYSTEM: ARCS FLIGHT: 3/2R ABORT: 3/3 MDAC ID: 1466

ITEM:

DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [3] B [P] C [P]

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 56V76A133A2CR5; A2CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU MANIFOLD 5 ISOL VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS MANIFOLD 5 ISOL SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF VRCS.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

DATE: 1/2 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1467

DIODE ITEM: FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS 5) DIODE

6)

7)

8) 9)

CRITICALITIES

	HDW/FUNC	ABORT RTLS:	HDW/FUNC
PRELAUNCH: LIFTOFF:	3/3 3/3	TAL:	3/3
ONORBIT: DEORBIT:	3/3 3/3	AOA: ATO:	3/3 3/3
LANDING/SAFING:	•	••••	5, 5

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 56V76A133A2CR5; A2CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. LOSE SOME ISOLATION BETWEEN BUSES MN A AND MN B. MDM HAS INTERNAL PROTECTION FROM REVERSE CURRENT - HIGH OUTPUT RESISTANCE.

1/22/87 HIGHEST CRITICALITY HDW/FUNC DATE:

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1468 3/3 ABORT:

ITEM: DIODE

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DIODE

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, PCA 3

PART NUMBER: 56V76A133A2CR13; A2CR12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO OPEN THE "OX & FU MANIFOLD 5 ISOL VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATE FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE: . DATE: 1/2 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3

MDAC ID: 1471

DIODE ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DIODE
- 6)
- 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 DS17; DS22

PART NUMBER: 33V73A7A2CR17, A2CR18; 33V73A7A3CR17, A3CR18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1472 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR14 TYPE I; AR16 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO INDICATE WHEN BOTH "OX & FU ISOL 1/2 VALVES" ARE FULLY CLOSED. INDICATES BARBERPOLE INSTEAD.

1/19/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

DATE: 1/1 SUBSYSTEM: ARCS

MDAC ID: 1473

FLIGHT: 3/3 ABORT: 3/3 ABORT:

ITEM:

DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2 5) DRIVER, HYBRID

6)

7)

8)

9)

CRITICALITIES

			
PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
LANDING/SAFING:			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR14 TYPE I; AR16 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO PROPERLY INDICATE STATUS OF "OX & FU ISOL 1/2 VALVES". INDICATES BARBERPOLE WHEN VALVES ARE OPEN AND INDICATES CLOSED WHEN VALVES ARE INBETWEEN (SHOULD BE BARBERPOLE).

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: ARCS FLIGHT: 3/3

MDAC ID: 1474 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
3/3		٥, ٥
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116AR13 TYPE I; AR15 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO INDICATE WHEN BOTH "OX & FU ISOL 1/2 VALVES" ARE FULLY OPENED. INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1475

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6ARl3 TYPE I; AR15 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO PROPERLY INDICATE STATUS "OX & FU ISOL 1/2 VALVES". INDICATES BARBERPOLE WHEN VALVES ARE CLOSED AND INDICATES OPEN WHEN VALVES ARE INBETWEEN (SHOULD BE BARBERPOLE).

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1476 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

'LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4ARl3 TYPE I; ARl1 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 A" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 A VALVES" ARE OPEN - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TALKBACKS VIA GPC DISPLAY.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 ABORT:

MDAC ID: 1477

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A
 5) DRIVER, HYBRID

6) 7)

8)

9)

CRITICALITIES

	CVTTTC		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4AR13 TYPE I; AR11 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 A" TO PROPERLY INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 A VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. ALSO INDICATES OPEN WHEN IT SHOULD INDICATE BARBERPOLE. CREW CAN DETERMINE VALVE POSITION FROM TALKBACKS VIA GPC DISPLAY.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1478 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:			J/ J

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76A114AR12 TYPE I; AR10 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 A" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 A VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO OPEN RELAYS TO CUT POWER TO "OX & FU ISOL 3/4/5A VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR THE GPC CLOSE VALVE COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/21/87

FLIGHT: 2/2 SUBSYSTEM: ARCS 1/1 ABORT: MDAC ID: 1479

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	2/2	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
TANDING/SAFING	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76All4AR12 TYPE I; AR10 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

STOPS, AND INDICATES WITH BARBERPOLE TALKBACK, THE CLOSURE OF BOTH "FU & OX TK ISOL 3/4/5 A VALVES" WHEN FUEL VALVE IS CLOSED, IGNORING THE OXID VALVE STATUS. THIS COULD RESULT IN LEAVING OXID LINE PARTIALLY OPENED, SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1480 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J4-115 TYPE I; J4-5 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 A" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 A VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO OPEN RELAYS TO CUT POWER TO "OX & FU ISOL 3/4/5 A VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR THE GPC CLOSE VALVE COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 1481 ABORT: 1/1

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A

5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	2/2	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J4-115 TYPE I; J4-5 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

STOPS, AND INDICATES WITH BARBERPOLE TALKBACK, THE CLOSURE OF BOTH "FU & OX TK ISOL 3/4/5 A VALVES" WHEN OXID VALVE IS CLOSED, IGNORING FUEL VALVE STATUS. THIS COULD RESULT IN LEAVING THE FUEL LINE PARTIALLY OPENED, SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1482 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5AR12 TYPE I; AR14 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 B" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 B VALVES" ARE OPEN - INDICATES BARBERPOLE INSTEAD.

CREW CAN DETERMINE VALVE POSITION FROM TALKBACKS VIA GPC DISPLAY.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE: SUBSYSTEM: ARCS

FLIGHT: 3/3 ABORT: 3/3 ABORT: MDAC ID: 1483

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) DRIVER, HYBRID

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A115AR12 TYPE I; AR14 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 B" TO PROPERLY INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 B VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. ALSO INDICATES OPEN WHEN IT SHOULD INDICATE BARBERPOLE. CREW CAN DETERMINE VALVE POSITION FROM TALKBACKS VIA GPC DISPLAY.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1484 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5ARll TYPE I; ARl3 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 B" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 B VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO OPEN RELAYS TO CUT POWER TO "OX & FU ISOL 3/4/5 A VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR THE GPC CLOSE VALVE COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

HIGHEST CRITICALITY HDW/FUNC 1/21/87

FLIGHT: 2/2 ABORT: 1/1 DATE: SUBSYSTEM: ARCS MDAC ID: 1485

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B
- DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

	CRITICALITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 2/2 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/1R 2/1R 2/1R

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5AR11 TYPE I; AR13 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE: STOPS, AND INDICATES WITH BARBERPOLE TALKBACK, THE CLOSURE OF BOTH "FU & OX TK ISOL 3/4/5 A VALVES" WHEN FUEL VALVE IS CLOSED, IGNORING THE OXID VALVE STATUS. THIS COULD RESULT IN LEAVING OXID LINE PARTIALLY OPENED, SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: ARCS

MDAC ID: 1486 FLIGHT: 3/3
ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) DRIVER, HYBRID

6) 7)

8) 9)

CRITICALITIES

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FLIGHT PHASE PRELAUNCH:	HDW/FUNC	ABORT	HDW/FUNC
LIFTOFF:	3/3 3/3	RTLS:	3/3
ONORBIT:	3/3	TAL:	3/3
DEORBIT:	3/3	AOA: ATO:	3/3
LANDING/SAFING:	3/3	AIO.	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A122AR J4-115 TYPE I; J4-5 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS TK ISOL 3/4/5 B" TO INDICATE WHEN BOTH "OX & FU TK ISOL 3/4/5 B VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO OPEN RELAYS TO CUT POWER TO "OX & FU ISOL 3/4/5 A VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR THE GPC CLOSE VALVE COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1487 ABORT: 1/1

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

	O11222		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	2/2	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A122AR J4-115 TYPE I; J4-5 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

STOPS, AND INDICATES WITH BARBERPOLE TALKBACK, THE CLOSURE OF BOTH "FU & OX TK ISOL 3/4/5 A VALVES" WHEN OXID VALVE IS CLOSED, IGNORING THE FUEL VALVE STATUS. THIS COULD RESULT IN LEAVING FUEL LINE PARTIALLY OPENED, SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1488 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR18 TYPE I; AR20 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO INDICATE WHEN BOTH "OX & FU XFEED 1/2 VALVES" ARE FULLY CLOSED. INDICATES BARBERPOLE INSTEAD.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/20/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1489

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2 5) DRIVER, HYBRID

6) 7)

8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
•	RTLS:	3/3
•	TAL:	3/3
•	AOA:	3/3
3/3	ATO:	3/3
3/3		
	- /	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR18 TYPE I; AR20 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO PROPERLY INDICATE STATUS "OX & FU XFEED 1/2 VALVES". INDICATES BARBERPOLE WHEN VALVES ARE OPEN AND INDICATES CLOSED WHEN VALVES ARE INBETWEEN (SHOULD BE BARBERPOLE).

HIGHEST CRITICALITY HDW/FUNC DATE: 1/20/87

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1490

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR17 TYPE I; AR19 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO INDICATE WHEN BOTH "OX & FU XFEED 1/2 VALVES" ARE FULLY OPENED. INDICATES BARBERPOLE INSTEAD.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1491 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116AR17 TYPE I; AR19 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO PROPERLY INDICATE STATUS "OX & FU XFEED 1/2 VALVES". INDICATES BARBERPOLE WHEN VALVES ARE CLOSED AND INDICATES OPEN WHEN VALVES ARE INBETWEEN (SHOULD BE BARBERPOLE).

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 1492 MDAC ID: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4AR16 TYPE I; AR14 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO INDICATE WHEN BOTH "OX & FU XFEED 3/4/5 VALVES" ARE FULLY CLOSED. INDICATES BARBERPOLE INSTEAD.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1493 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4AR16 TYPE I; AR14 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO PROPERLY INDICATE STATUS "OX & FU XFEED 3/4/5 VALVES". INDICATES BARBERPOLE WHEN VALVES ARE OPEN AND INDICATES CLOSED WHEN VALVES ARE INBETWEEN (SHOULD BE BARBERPOLE).

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1494 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING	: 3/3			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4AR15 TYPE I; AR15 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO INDICATE WHEN BOTH "OX & FU XFEED 3/4/5 VALVES" ARE FULLY OPENED. INDICATES BARBERPOLE INSTEAD.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1495 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76A114AR15 TYPE I; AR15 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE TALKBACK TO PROPERLY INDICATE STATUS "OX & FU XFEED 3/4/5 VALVES". INDICATES BARBERPOLE WHEN VALVES ARE CLOSED AND INDICATES OPEN WHEN VALVES ARE INBETWEEN (SHOULD BE BARBERPOLE).

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1496 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS
- 5) DRIVER, HYBRID
- 6)
- 7)
- 9)

CRITICALITIES

	~-·		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5ARl0 TYPE I; AR7 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 1 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 1 ISOL VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 1 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1497 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5ARl0 TYPE I; AR7 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 1 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 1 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 1/2. ALSO CAUSED BARBERPOLE INDICATOR TO SHOW BARBERPOLE WHEN OPEN AND SHOW CLOSED WHEN SHOULD SHOW BARBERPOLE. THE CORRECT VALVE POSITIONS ARE STILL AVAILABLE FROM FOUR VALVE TALKBACKS VIA GPC DISPLAY.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 ABORT: MDAC ID: 1498

DRIVER, HYBRID ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS
- DRIVER, HYBRID 5)

6)

7) 8)

9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		•
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A115AR9 TYPE I; AR8 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 1 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 1 ISOL VALVES" ARE OPENED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 1 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME OPENED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

HIGHEST CRITICALITY HDW/FUNC

1/21/87 3/1R DATE: FLIGHT: SUBSYSTEM: ARCS 1/1 ABORT: 1499 MDAC ID:

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

SUBSYS LEAD: D.J. PAUL LEAD ANALYST: W.A. HAUFLER

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) PROP STOR & DIST SUBSYSTEM

MANIFOLD 1, L/R OX & FU ISOL VLVS 4)

DRIVER, HYBRID

6) 7)

8) 9)

CRITICALITIES

	CRITICA	CRITICALITIES	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/1R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 3/2R 3/2R 3/2R

REDUNDANCY SCREENS: A [2] B [F] C [P]

AV BAY 5, MCA 2 LOCATION:

PART NUMBER: 55V76All5AR9 TYPE I; AR8 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 1 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 1 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1500 ABORT: 3/3

ITEM:

DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

ETTAUM BUSAN	CRITICALITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4AR9 TYPE I; AR7 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 2 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 2 ISOL VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 2 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1501 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE · H	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4AR9 TYPE I; AR7 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 2 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 2 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 1/2. ALSO CAUSED BARBERPOLE INDICATOR TO SHOW BARBERPOLE WHEN OPEN AND SHOW CLOSED WHEN SHOULD SHOW BARBERPOLE. THE CORRECT VALVE POSITIONS ARE STILL AVAILABLE FROM FOUR VALVE TALKBACKS VIA GPC DISPLAY.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1502

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

01/1110			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4AR8 TYPE I; AR6 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 2 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 2 ISOL VALVES" ARE OPENED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 2 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME OPENED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

HIGHEST CRITICALITY HDW/FUNC

1/21/87 DATE: FLIGHT: 3/1R ABORT: 1/1 SUBSYSTEM: ARCS ABORT: MDAC ID: 1503

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS 2)

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 2, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/1R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 3/2R 3/2R 3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76A114AR8 TYPE I; AR6 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 2 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 2 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1504 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, -

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR6; AR8 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

### EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 3 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 3 ISOL VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 3 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 ABORT: 1505 MDAC ID:

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS
- PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- DRIVER, HYBRID
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

	CVTTTCV		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/3 3/3	ABORT RTLS: TAL: AOA:	HDW/FUNC 3/3 3/3 3/3
DEORBIT: LANDING/SAFING:	3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR6; AR8 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 3 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 3 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 3/4/5 A OR B. ALSO CAUSED BARBERPOLE INDICATOR TO SHOW BARBERPOLE WHEN OPEN AND SHOW CLOSED WHEN SHOULD SHOW BARBERPOLE. THE CORRECT VALVE POSITIONS ARE STILL AVAILABLE FROM FOUR VALVE TALKBACKS VIA GPC DISPLAY.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1506 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

#### CRITICALITIES

	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR5; AR7 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

## EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 3 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 3 ISOL VALVES" ARE OPENED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 3 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME OPENED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS

ABORT: 1/1 MDAC ID: 1507

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 3, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	•		-

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR5; AR7 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

#### EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 3 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 3 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1508 3/3 ABORT:

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

#### BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID *

6)

7) 8)

9)

#### CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6ARl0; ARl2 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 4 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 4 ISOL VALVES" ARE CLOSED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 4 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME CLOSED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1509 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING	: 3/3		·	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR10; AR12 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 4 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 4 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 3/4/5 A OR B. ALSO CAUSED BARBERPOLE INDICATOR TO SHOW BARBERPOLE WHEN OPEN AND SHOW CLOSED WHEN SHOULD SHOW BARBERPOLE. THE CORRECT VALVE POSITIONS ARE STILL AVAILABLE FROM FOUR VALVE TALKBACKS VIA GPC DISPLAY.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1510

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR9; AR11 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF BARBERPOLE INDICATOR "AFT L/R RCS MANIF 4 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIF 4 ISOL VALVES" ARE OPENED - INDICATES BARBERPOLE INSTEAD. CREW CAN DETERMINE VALVE POSITION FROM TWO TALKBACKS VIA GPC DISPLAY. ALSO LOSE CAPABILITY TO CUT POWER TO "OX & FU MANIF 4 ISOL VALVE" MOTORS WHEN BOTH VALVES BECOME OPENED. POWER TO MOTORS CONTINUES UNTIL SWITCH IS MOVED TO ITS GPC POSITION OR COMMAND ENDS. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1511 ABORT: 1/1

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

	O1/2 + Z O1.22 - Z - Z			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	1/1	
LIFTOFF:	3/3	TAL:	3/2R	
ONORBIT:	3/2R	AOA:	3/2R	
DEORBIT:	3/1R	ATO:	3/2R	
LANDING/SAFING:	: 3/3			

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6AR9; AR11 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 4 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 4 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1512 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J9-51 (180) TYPE I; AR J9-50 (163) TYPE

I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO CLOSE "OX & FU MANIFOLD 5 ISOL VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECTS SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1513 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J9-51 (180) TYPE I; AR J9-50 (163) TYPE

Ι

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU MANIFOLD 5 ISOL VALVES", SINCE THIS FAILURE CONSTANTLY POWERS THE VALVE CLOSE SOLENOIDS, UNLESS "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" IS IN OPEN POSITION. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF VRCS.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

FLIGHT: 3/3 SUBSYSTEM: ARCS 1514 ABORT: 3/3 MDAC ID:

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- CONTROLS 2)
- PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J11-Q (178) TYPE III; AR J11-N (161)

TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC OR "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO CLOSE "OX & FU MANIFOLD 5 ISOL VALVES". ALL REDUNDANCY IS LOST TO CLOSE THE VALVES. THE EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE:

1/22/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS

FLIGHT: 3/2R

MDAC ID: 1515

ABORT:

3/3

ITEM:

DRIVER, HYBRID

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/3 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J11-Q (178) TYPE III; AR J11-N (161)

TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY TO AUTOMATICALLY INHIBIT CLOSING THE VALVES WHEN THEY BECOME FULLY CLOSED. HOWEVER, VALVE CAN STILL BE OPENED VIA SWITCH OR GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF VRCS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1516 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J8-70 (179) TYPE I; AR J8-56 (162) TYPE

I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC TO OPEN THE "OX & FU MANIFOLD 5 ISOL VALVES". VALVES CAN STILL BE OPERATED BY "AFT L RCS MANIFOLD 5 ISOL SWITCH". FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF VRCS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1517 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J8-70 (179) TYPE I; AR J8-56 (162) TYPE

Ι

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

CONSTANTLY COMMANDS "OX & FU MANIFOLD 5 ISOL VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1518 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-70 TYPE I; J8-56 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO OPEN THE "OX & FU MANIFOLD 5 ISOL VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECT WOULD BE THE SAME AS VALVE FAILS TO CLOSE CASE, RESULTING IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

1/22/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 ABORT: MDAC ID: 1519

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7) 8)

9)

CRITICALITIES

PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC 3/3 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 3/3
DEORBIT: LANDING/SAFING:	3/3 3/3	AIO.	3, 3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, LCA 1

PART NUMBER: 54V76A121AR J8-70 TYPE I; J8-56 TYPE I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE: CONSTANTLY COMMANDS "OX & FU MANIFOLD 5 ISOL VALVE" TO OPEN, EVEN WHEN AT FULL OPEN POSITION. WHEN SWITCH OR GPC COMMANDS VALVE TO CLOSE, BOTH OPEN AND CLOSE SOLENOIDS IN THE VALVES ARE POWERED UP. THE EFFECT IS THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1520 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		-, -
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J8-68 (177) TYPE I; AR J8-50 (160) TYPE

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CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE OPEN POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS MANIFOLD 5 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIFOLD 5 ISOL VALVES" ARE FULLY OPEN - INDICATES BARBERPOLE INSTEAD. ALSO LOSE CAPABILITY OF INHIBITING THE OPENING OF THE VALVES VIA THE SWITCH WHEN VALVES BECOME OR ARE ALREADY FULLY OPEN, BUT WILL NOT DAMAGE VALVE.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: ARCS 3/3 ABORT: MDAC ID: 1521

DRIVER, HYBRID ITEM: FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
	-, -		•
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J8-68 (177) TYPE I; AR J8-50 (160) TYPE

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

INHIBITS OPENING OF THE VALVES VIA "AFT L/R RCS MANIFOLD 5 ISOL SWITCH". VALVES CAN STILL BE OPERATED BY GPC. LOSE CAPABILITY OF BARBERPOLE TALKBACK "AFT L RCS MANIFOLD 5 ISOL" TO PROPERLY INDICATE WHEN BOTH "OX & FU MANIFOLD 5 ISOL VALVES" ARE FULLY CLOSED. INDICATES BARBERPOLE INSTEAD. ALSO INDICATES OPEN WHEN IT SHOULD INDICATE BARBERPOLE. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVE FAILS TO OPEN CASE. THIS CASE RESULTS IN LOSS OF VRCS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1522 ABORT: 3/3

ITEM: DRIVER, HYBRID

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) DRIVER, HYBRID
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J8-71 (176) TYPE II; AR J8-48 (159)

TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CLOSE POSITION OF BARBERPOLE INDICATOR "AFT L/R RCS MANIFOLD 5 ISOL" TO INDICATE WHEN BOTH "OX & FU MANIFOLD 5 ISOL VALVES" ARE FULLY CLOSED - INDICATES BARBERPOLE INSTEAD. ALSO LOSE CAPABILITY OF INHIBITING THE CLOSING OF THE VALVES VIA THE SWITCH WHEN VALVES BECOME OR ARE ALREADY FULLY CLOSED, BUT WILL NOT DAMAGE VALVE.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1523 ABORT: 3/3

ITEM: DRIVER, HYBRID FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) DRIVER, HYBRID

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3

PART NUMBER: 56V76A123AR J8-71 (176) TYPE II; AR J8-48 (159)

TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

INHIBITS CLOSING OF THE VALVES VIA "AFT L/R RCS MANIFOLD 5 ISOL SWITCH". VALVES CAN STILL BE OPERATED BY GPC. LOSE CAPABILITY OF BARBERPOLE TALKBACK "AFT L RCS MANIFOLD 5 ISOL" TO PROPERLY INDICATE WHEN BOTH "OX & FU MANIFOLD 5 ISOL VALVES" ARE FULLY OPENED. INDICATES BARBERPOLE INSTEAD. ALSO INDICATES CLOSED WHEN IT SHOULD INDICATE BARBERPOLE. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN LOSS OF VRCS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1524 ABORT: 3/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S16; PNL 07 S19

PART NUMBER: 33V73A7F14; F18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS TK ISOL 1/2 SWITCH" TO CLOSE THE "OX & FU TK ISOL 1/2 VALVES", OVERRIDING THE GPC COMMANDS.
VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1525 ABORT: 3/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 1/2

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S16; PNL 07 S19

PART NUMBER: 33V73A7F13; F17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS TK ISOL 1/2 SWITCH" TO CLOSE THE "OX & FU TK ISOL 1/2 VALVES", OVERRIDING THE GPC COMMANDS.
VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO CLOSE CASE.
THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1526 ABORT: 3/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S17; S20 PART NUMBER: 33V73A7F15; F19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" TO OPEN AND CLOSE THE "OX & FU TK ISOL 3/4/5 A VALVES". VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, WORST CASE EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN.

IF THE "TK ISOL 1/2 VALVE" ALSO FAILS, THIS CASE WILL AFFECT CROSSFEED OPERATIONS AND ENTRY DTOS AND PTIS. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH, DURING RTLS, MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES. SIMILARLY, FAILURE OF ALL REDUNDANCY MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1527 ABORT: 3/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) FUSE, 1A

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S18; S21 PART NUMBER: 33V73A7F16; F20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" TO OPEN AND CLOSE THE "OX & FU TK ISOL 3/4/5 B VALVES". VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, WORST CASE EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. IF THE "TK ISOL 1/2 VALVE" ALSO FAILS, THIS CASE WILL AFFECT CROSSFEED OPERATIONS AND ENTRY DTOS AND PTIS. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH, DURING RTLS, MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES. SIMILARLY, FAILURE OF ALL REDUNDANCY MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1528 ABORT: 2/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S36
PART NUMBER: 33V73A7F41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE ONE OF THREE REDUNDANT SIGNAL PATHS FROM THE "MASTER RCS XFEED" SWITCH TO THE GPCS TO CONTROL WHETHER TO AUTO CROSSFEED FROM THE LEFT OR THE RIGHT OMS POD. NO EFFECT. FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE SAME AS ANY CROSSFEED VALVE FAILS TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY CAUSE INABILITY TO BALANCE AND/OR EXPEL PROPELLANT, RESULTING IN THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES BEING EXCEEDED DUE TO THE TRAPPED PROPELLANT'S WEIGHT. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 3/4/5 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

HIGHEST CRITICALITY HDW/FUNC 1/20/87 DATE: FLIGHT: 3/2R SUBSYSTEM: ARCS 2/1R ABORT:

MDAC ID: 1529

FUSE, 1A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) FUSE, 1A

6)

7) 8)

9)

CRITICALITIES

	O1/2 7 2 011 2 2 2 2 2		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
	•	AOA:	3/1R
ONORBIT:	3/2R		3/1R
DEORBIT:	3/3	ATO:	2/ TK
TANDING/SAFING:	3/3		

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S36 PART NUMBER: 33V73A7F42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE ONE OF THREE REDUNDANT SIGNAL PATHS FROM THE "MASTER RCS XFEED" SWITCH TO THE GPCS TO CONTROL WHETHER TO CROSSFEED FROM THE LEFT OR THE RIGHT OMS POD. NO EFFECT. FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE SAME AS ANY CROSSFEED VALVE FAILS TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY CAUSE INABILITY TO BALANCE AND/OR EXPELL PROPELLANT, RESULTING IN THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES BEING EXCEEDED DUE TO THE TRAPPED PROPELLANT'S WEIGHT. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 3/4/5 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1530 ABORT: 2/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		-/

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S36
PART NUMBER: 33V73A7F43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE ONE OF THREE REDUNDANT SIGNAL PATHS FROM THE "MASTER RCS XFEED" SWITCH TO THE GPCS TO CONTROL WHETHER TO CROSSFEED FROM THE LEFT OR THE RIGHT OMS POD. NO EFFECT. FOR LOSS OF ALL REDUNDANCY, THE EFFECT WOULD BE SAME AS ANY CROSSFEED VALVE FAILS TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY CAUSE INABILITY TO BALANCE AND/OR EXPELL PROPELLANT, RESULTING IN THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES BEING EXCEEDED DUE TO THE TRAPPED PROPELLANT'S WEIGHT. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 3/4/5 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

DATE:

1/20/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS

FLIGHT: 3/2R

MDAC ID: 1531

ABORT:

3/3

ITEM:

FUSE, 1A

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S32; PNL 07 S34

PART NUMBER: 33V73A7F34; F38

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS XFEED 1/2 SWITCH" TO CLOSE THE "OX & FU XFEED 1/2 VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 . HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1532 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S32; PNL 07 S34

PART NUMBER: 33V73A7F33; F37

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS XFEED 1/2 SWITCH" TO CLOSE THE "OX & FU XFEED 1/2 VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1533 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 3/4/5

5) FUSE, 1A

6)

7)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF:	HDW/FUNC 3/3 3/3	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3
ONORBIT: DEORBIT: LANDING/SAFING:	3/2R 3/3 3/3	AOA: ATO:	3/3 3/3

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S33; PNL 07 S35

PART NUMBER: 33V73A7F36; F40

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS XFEED 3/4/5 SWITCH" TO CLOSE THE "OX & FU XFEED 3/4/5 VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE THE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1534 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) FUSE, 1A
- 6)
- 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S33; PNL 07 S35

PART NUMBER: 33V73A7F35; F39

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS XFEED 3/4/5 SWITCH" TO CLOSE THE "OX & FU XFEED 3/4/5 VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS 2/1R ABORT: MDAC ID: 1535

FUSE, 1A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 1, L/R OX & FU ISOL VLVS

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	2/1R
3/3	TAL:	3/2R
3/2R	AOA:	3/2R
3/1R	ATO:	3/2R
3/3		
	3/3 3/3 3/2R 3/1R	3/3 RTLS: 3/3 TAL: 3/2R AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S22; S27 PART NUMBER: 33V73A7F21; F27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIF ISOL 1 SWITCH" TO OPEN AND CLOSE THE "OX & FU MANIF ÍSOL 1 VALVES". VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, WORST CASE EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE THREE PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

1/21/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS MDAC ID: 1536 ABORT: 2/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS

FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S23; S28 PART NUMBER: 33V73A7F22; F28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIF ISOL 2 SWITCH" TO OPEN AND CLOSE THE "OX & FU MANIF ISOL 2 VALVES". VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, WORST CASE EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIs. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE THREE PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS ABORT: 2/1R MDAC ID: 1537

FUSE, 1A ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- 5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S24; S29 PART NUMBER: 33V73A7F23; F29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIF ISOL 3 SWITCH" TO OPEN AND CLOSE THE "OX & FU MANIF ISOL 3 VALVES". VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, WORST CASE EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE THREE PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1538 ABORT: 2/1R

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL 07 S25; S30 PART NUMBER: 33V73A7F24; F30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIF ISOL 4 SWITCH" TO OPEN AND CLOSE THE "OX & FU MANIF ISOL 4 VALVES". VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, WORST CASE EFFECTS WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE.

DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE THREE PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1539 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 5, L/R OX & FU ISOL VLVS

5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 S26, S31 PART NUMBER: 33V73A7F25; F31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO CLOSE THE "OX & FU MANIFOLD 5 ISOL VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1540 ABORT: 3/3

ITEM: FUSE, 1A FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 5, L/R OX & FU ISOL VLVS
- 5) FUSE, 1A

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL 07 S26, S31 PART NUMBER: 33V73A7F26; F32

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF "AFT L/R RCS MANIFOLD 5 ISOL SWITCH" TO CLOSE THE "OX & FU MANIFOLD 5 ISOL VALVES", OVERRIDING THE GPC COMMANDS. VALVES CAN STILL BE FULLY OPERATED BY GPC. FOR LOSS OF ALL REDUNDANCY, THE EFFECTS WOULD BE THE SAME AS THE VALVES FAIL TO CLOSE CASE. THIS CASE RESULTS IN NO EFFECT SINCE PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVES 3/4/5 A OR B, AND VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1541 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS OPEN (DE-ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 1/2

5) RELAY

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K30, K29; K38, K37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC COMMAND TO OPEN BOTH "OX & FU TK ISOL 1/2 VALVE", SIMULTANEOUSLY. CAN STILL OPEN BOTH VALVES WITH "AFT L/R RCS TK ISOL 1/2 SWITCH" OR INDIVIDUALLY WITH TWO OTHER GPC COMMANDS. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF MANIFOLDS 1&2. FIRST FAILURE WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH WILL AFFECT ONORBIT CROSSFEED OPERATIONS, ENTRY DTOS AND PTIS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING RTLS TO MEET LANDING WEIGHT CONSTRAINTS AND/OR CG SAFETY BOUNDARIES. SIMILARLY, NEXT FAILURE ASSOCIATED WITH VALVE FAILURE MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1542 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS HIGH (ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	3/2R	ATO:	2/1R
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K30, K29; K38, K37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 1/2 SWITCH" TO CLOSE "OX OR FU ISOL 1/2 VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS REGARDLESS OF COMMAND SIGNAL, BUT WILL NOT DAMAGE VALVE. THE EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1543 ABORT: 2/1R

ITEM:

RELAY

FAILURE MODE: FAILS OPEN (DE-ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:			•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV

AV BAY 6, MCA 3

PART NUMBER: 56V76A116K31, K27; K39, K35

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF ONE GPC COMMAND TO OPEN ONLY THE "OX (FU) TK ISOL 1/2 VALVE". CAN STILL OPEN VALVE, ALONG WITH THE OTHER VALVE "FU (OX) TK ISOL 1/2 VALVE", WITH ANOTHER GPC COMMAND OR WITH SWITCH "AFT L/R RCS TK ISOL 1/2". FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN LOSS OF SIX PRIMARY JETS WHICH WILL AFFECT ONORBIT CROSSFEED OPERATIONS, ENTRY DTOS AND PTIS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING RTLS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR CG SAFETY BOUNDARIES. SIMILARLY, NEXT FAILURE ASSOCIATED WITH THE VALVE MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1544 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS HIGH (ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RELAY
- 6)
- 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	3/2R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K31, K27; K39, K35

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 1/2 SWITCH" TO CLOSE THE "OX OR FU ISOL 1/2 VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS REGARDLESS OF COMMAND SIGNAL, BUT WILL NOT DAMAGE VALVE. THE EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: ARCS ABORT: 1/1 MDAC ID: 1545

RELAY ITEM:

FAILURE MODE: FAILS OPEN (DE-ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 1/2

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/1R 2/1R 2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K32, K28; K41, K36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE: LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 1/2 SWITCH" TO CLOSE THE "OX OR FU ISOL 1/2 VALVE", OVERRIDING GPC COMMANDS. THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1546 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH (ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		, -

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76Al16K32, K28; K41, K36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. NEITHER VALVE WILL CLOSE UNTIL THE OTHER CLOSE RELAY IS ENERGIZED, SINCE THAT RELAY'S SWITCH IS IN SERIES WITH THE FAILED RELAY'S SWITCH.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

FLIGHT: 3/2R SUBSYSTEM: ARCS ABORT: 1/1 MDAC ID: 1547

RELAY ITEM:

FAILURE MODE: FAILS OPEN (DE-ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS 2)

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 1/2

RELAY 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/2R 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 1/1 2/1R 2/1R 2/1R
THIDING, DAT THE	5,5		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K33, K26; K40, K34

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 1/2 SWITCH" TO CLOSE THE "OX & FU ISOL 1/2 VALVES", OVERRIDING THE GPC COMMANDS. THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1548 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS HIGH (ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		, ==:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K33, K26; K40, K34

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

WHEN GPC ONLY COMMANDS CLOSE THE OTHER VALVE "FU (OX) ISOL 1/2 VALVE", THEN THIS VALVE (ASSOCIATED WITH THE FAILED RELAY) "OX (FU) ISOL 1/2 VALVE" WILL ALSO CLOSE. VALVE CAN STILL BE OPENED. FOR LOSS OF ALL REDUNDANCY THIS UNINTENDED EVENT'S EFFECTS ARE SIMILAR TO VALVE FAILS TO OPEN CASE. THIS CASE WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH WILL AFFECT ONORBIT CROSSFEED OPERATIONS, ENTRY DTOS AND PTIS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING RTLS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES. SIMILARLY, NEXT FAILURE ASSOCIATED WITH THE VALVE MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

1/21/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS ABORT:

FLIGHT: 3/1R

MDAC ID: 1549

2/1R

ITEM:

RELAY

FAILURE MODE: FAILS OPEN (DE-ENERGIZED)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A

5) RELAY

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	3/1R	ATO:	2/1R
LANDING/SAFING:	*		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K30, K32; K26, K28

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" TO OPEN THE "OX OR FU TK ISOL 3/4/5 A VALVE". THÍS VALVE WILL REMAIN OPEN ONLY IF THE VALVE WAS OPEN AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED CLOSED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO OPEN, EITHER FUEL OR OXIDIZER LINE IS OPENED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO OPEN CASE. IF THE "TK ISOL 1/2 VALVE" ALSO FAILS, THIS CASE WILL AFFECT CROSSFEED OPERATIONS AND ENTRY DTOS AND PTIS. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH, DURING RTLS, MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES. SIMILARLY, FAILURE OF ALL REDUNDANCY MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1550 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS CLOSED (FAILS IN ENERGIZED POSITION)

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 A
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	2/2	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76A114K30, K32; K26, K28

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" TO CLOSE THE "OX OR FU TK ISOL 3/4/5 A VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO CLOSE, BUT WILL NOT DAMAGE VALVE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 2/2 SUBSYSTEM: ARCS 1/1 ABORT: MDAC ID: 1551

RELAY ITEM:

FAILURE MODE: FAILS OPEN

SUBSYS LEAD: D.J. PAUL LEAD ANALYST: W.A. HAUFLER

BREAKDOWN HIERARCHY:

ELECTRICAL COMPONENTS 1)

CONTROLS 2)

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 A

RELAY 5)

6)

7) 8)

9)

CRITICALITIES

V-14 - 2 - V-1 - 2			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	2/2	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

AV BAY 4, MCA 1 LOCATION:

PART NUMBER: 54V76A114K29, K31; K25, K27

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" TO CLOSE THE "OX OR FU TK ISOL 3/4/5 A VALVE". THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1552 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 A

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	3/1R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K29, K31; K25, K27

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" TO OPEN THE "OX OR FU TK ISOL 3/4/5 A VALVE". ROUTES REVERSE (CLOSING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO OPEN, BUT WILL NOT DAMAGE VALVE. WHEN VALVES ARE COMMANDED TO OPEN, EITHER FUEL OR OXIDIZER LINE IS OPENED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO OPEN CASE. IF THE "TK ISOL 1/2 VALVE" ALSO FAILS, THIS CASE WILL AFFECT CROSSFEED OPERATIONS AND ENTRY DTOS AND PTIS. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH, DURING RTLS, MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES. SIMILARLY, FAILURE OF ALL REDUNDANCY MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/21/87

FLIGHT: 3/1R SUBSYSTEM: ARCS ABORT: 2/1R MDAC ID: 1553

RELAY ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 B

RELAY

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	3/1R	ATO:	2/1R
LANDING/SAFING:	•		-

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A115K24, K29; K28, K30

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" TO OPEN THE "OX OR FU TK ISOL 3/4/5 B VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVE WAS OPEN AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED CLOSED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO OPEN, EITHER FUEL OR OXIDIZER LINE IS OPENED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO OPEN CASE. IF THE "TK ISOL 1/2 VALVE" ALSO FAILS, THIS CASE WILL AFFECT CROSSFEED OPERATIONS AND ENTRY DTOS AND PTIS. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH, DURING RTLS, MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES. SIMILARLY, FAILURE OF ALL REDUNDANCY MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1554 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	2/2	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING	: 3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5K24, K29; K28, K30

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" TO CLOSE THE "OX OR FU TK ISOL 3/4/5 B VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO CLOSE, BUT WILL NOT DAMAGE VALVE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 1555 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	2/2	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	: 3/3		
THIDING, DRI THE	. 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76All5K25, K27; K26, K31

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" TO CLOSE THE "OX OR FU TK ISOL 3/4/5 B VALVE". THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND POSSIBLE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1556 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 3/4/5 B

5) RELAY

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	3/1R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, MCA 2

PART NUMBER: 55V76A115K25, K27; K26, K31

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" TO OPEN THE "OX OR FU TK ISOL 3/4/5 B VALVE". ROUTES REVERSE (CLOSING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO OPEN, BUT WILL NOT DAMAGE VALVE. WHEN VALVES ARE COMMANDED TO OPEN, EITHER FUEL OR OXIDIZER LINE IS OPENED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO OPEN CASE. IF THE "TK ISOL 1/2 VALVE" ALSO FAILS, THIS CASE WILL AFFECT CROSSFEED OPERATIONS AND ENTRY DTOS AND PTIS. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF SIX PRIMARY JETS WHICH, DURING RTLS, MAY CAUSE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE CG SAFETY BOUNDARIES. SIMILARLY, FAILURE OF ALL REDUNDANCY MAY RESULT IN LOSS OF VEHICLE DURING ENTRY AND OTHER ABORTS.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1557 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:			

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K45, K46; K53, K54

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC COMMAND TO OPEN BOTH "OX & FU XFEED 1/2 VALVE", SIMULTANEOUSLY. CAN STILL OPEN BOTH VALVES WITH "AFT L/R RCS XFEED 1/2 SWITCH" OR INDIVIDUALLY WITH TWO OTHER GPC COMMANDS. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY CAUSE INABILITY TO EXPEL NEXT ASSOCIATED FAILURE (VALVE 1/2) CAUSING INABILITY TO BALANCE AND/OR EXPEL PROPELLANT, RESULTING IN THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES BEING EXCEEDED. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 3/4/5 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

DATE: HIGHEST CRITICALITY HDW/FUNC 1/20/87

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1558 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/2	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116K45, K46; K53, K54

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 1/2 SWITCH" TO CLOSE "OX OR FU XFEED 1/2 VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS REGARDLESS OF COMMAND SIGNAL, BUT WILL NOT DAMAGE VALVE. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1559 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K43, K47; K51, K55

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF ONE GPC COMMAND TO OPEN ONLY THE "OX (FU) XFEED 1/2 VALVE". CAN STILL OPEN VALVE, ALONG WITH THE OTHER VALVE "FU (OX) XFEED 1/2 VALVE", WITH ANOTHER GPC COMMAND OR WITH SWITCH "AFT L/R RCS XFEED 1/2". FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY CAUSE INABILITY TO EXPEL NEXT ASSOCIATED FAILURE (VALVE 3/4/5) CAUSING INABILITY TO BALANCE AND/OR EXPEL PROPELLANT, RESULTING IN THE TANK LANDING CONSTRAINTS AND SAFETY BOUNDARIES BEING EXCEEDED. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 3/4/5 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

1/20/87 HIGHEST CRITICALITY HDW/FUNC DATE:

FLIGHT: 2/2 SUBSYSTEM: ARCS 3/3 ABORT: MDAC ID: 1560

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K43, K47; K51, K55

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 1/2 SWITCH" TO CLOSE THE "OX OR FU XFEED 1/2 VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS REGARDLESS OF COMMAND OR LACK OF COMMAND, BUT WILL NOT DAMAGE VALVE. THE EFFECTS ARE THE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1561 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 1/2

5) RELAY

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K44, K49; K52, K57

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 1/2 SWITCH" TO CLOSE THE "OX & FU XFEED 1/2 VALVES", OVERRIDING THE GPC COMMANDS. THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1562 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFIN	G: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K44, K49; K52, K57

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. NEITHER VALVE WILL CLOSE UNTIL THE OTHER CLOSE RELAY IS ENERGIZED, SINCE THAT RELAY'S SWITCH IS IN SERIES WITH THE FAILED RELAY'S SWITCH.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 1563 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

	HDW/FUNC	ABORT RTLS:	HDW/FUNC 3/3
PRELAUNCH: LIFTOFF:	3/3 3/3	TAL:	3/3
ONORBIT: DEORBIT:	2/2 3/3	AOA: ATO:	3/3 3/3
LANDING/SAFING:	•		3 / 3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K42, K48; K50, K56

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 1/2 SWITCH" TO CLOSE THE "OX & FU XFEED 1/2 VALVES", OVERRIDING THE GPC COMMANDS. THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1564 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 1/2

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6K42, K48; K50, K56

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

WHEN GPC COMMANDS CLOSE ONLY THE OTHER VALVE "FU (OX) XFEED 1/2 VALVE", THEN THIS VALVE (ASSOCIATED WITH THE FAILED RELAY) "OX (FU) XFEED 1/2 VALVE" WILL ALSO CLOSE. VALVE CAN STILL BE OPENED. FOR LOSS OF ALL REDUNDANCY THIS UNINTENDED EVENT'S EFFECTS ARE SIMILAR TO THE VALVE FAILS TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY RESULT IN NEXT ASSOCIATED FAILURE (VALVE 3/4/5) CAUSING INABILITY TO BALANCE AND/OR EXPEL PROPELLANT RESULTING IN THE TANK LANDING AND CG SAFETY BOUNDARIES BEING EXCEEDED. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 3/4/5 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

HIGHEST CRITICALITY HDW/FUNC 1/20/87 DATE:

3/2R FLIGHT: SUBSYSTEM: ARCS 2/1R ABORT: MDAC ID: 1565

RELAY ITEM:

FAILURE MODE: FAILS OPEN

SUBSYS LEAD: D.J. PAUL LEAD ANALYST: W.A. HAUFLER

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

CONTROLS 2)

PROP STOR & DIST SUBSYSTEM 3)

4) L/R OX & FU CROSSFEED VLV 3/4/5

5) RELAY

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/3 3/2R 3/3 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 2/1R 3/1R 3/1R 3/1R

REDUNDANCY SCREENS: A [2] B [F] C [P]

AV BAY 4, MCA 1 LOCATION:

PART NUMBER: 54V76All4K67, K66; K40, K36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC COMMAND TO OPEN BOTH "OX & FU XFEED 3/4/5 VALVE", SIMULTANEOUSLY. CAN STILL OPEN BOTH VALVES WITH "AFT L/R RCS XFEED 3/4/5 SWITCH" OR INDIVIDUALLY WITH TWO OTHER GPC COMMANDS. FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND MAY CAUSE INABILITY TO BALANCE AND/OR EXPEL PROPELLANT, RESULTING IN THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES BEING EXCEEDED DUE TO THE TRAPPED PROPELLANT'S WEIGHT. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 1/2 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1566 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:			3, 3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K67, K66; K40, K36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 3/4/5 SWITCH" TO CLOSE "OX OR FU XFEED 3/4/5 VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS REGARDLESS OF COMMAND SIGNAL, BUT WILL NOT DAMAGE VALVE. THE EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1567 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) L/R OX & FU CROSSFEED VLV 3/4/5

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K65, K68; K39, K35

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF ONE GPC COMMAND TO OPEN ONLY THE "OX (FU) XFEED 3/4/5 VALVE". CAN STILL OPEN VALVE, ALONG WITH THE OTHER VALVE "FU (OX) XFEED 3/4/5 VALVE", WITH ANOTHER GPC COMMAND OR WITH SWITCH "AFT L/R RCS XFEED 3/4/5". FOR LOSS OF ALL REDUNDANCY, EFFECTS WOULD BE SAME AS VALVES FAIL TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS AND MAY CAUSE INABILITY TO BALANCE AND/OR EXPEL PROPELLANT, RESULTING IN THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES BEING EXCEEDED DUE TO THE TRAPPED PROPELLANT'S WEIGHT. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 1/2 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1568 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K65, K68; K39, K35

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 3/4/5 SWITCH" TO CLOSE THE "OX OR FU XFEED 3/4/5 VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS REGARDLESS OF COMMAND OR LACK OF COMMAND, BUT WILL NOT DAMAGE VALVE. THE EFFECTS ARE THE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2 MDAC ID: 1569 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K69, K70; K38, K34

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 3/4/5 SWITCH" TO CLOSE THE "OX & FU XFEED 1/2 VALVES", OVERRIDING THE GPC COMMANDS. THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

HIGHEST CRITICALITY HDW/FUNC 1/20/87 DATE:

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1570

RELAY ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) RELAY
- 6)
- 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76A114K69, K70; K38, K34

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. NEITHER VALVE WILL CLOSE UNTIL THE OTHER CLOSE RELAY IS ENERGIZED, SINCE THAT RELAY'S SWITCH IS IN SERIES WITH THE FAILED RELAY'S SWITCH.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 1571 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	,		-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K71, K72; K37, K33

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS XFEED 3/4/5 SWITCH" TO CLOSE THE "OX & FU XFEED 3/4/5 VALVES", OVERRIDING THE GPC COMMANDS. THIS VALVE WILL REMAIN CLOSED ONLY IF THE VALVE WAS CLOSED AT TIME OF FAILURE AND IF THE VALVE IS NOT COMMANDED OPENED SINCE FAILURE. WHEN VALVES ARE COMMANDED TO CLOSE, EITHER FUEL OR OXIDIZER LINE IS CLOSED BUT NOT BOTH. EFFECTS ARE SAME AS VALVE FAILS TO CLOSE CASE. THIS CASE MAY RESULT IN AFFECTING CROSSFEED OPERATIONS DURING ONORBIT PHASE.

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/2R MDAC ID: 1572 ABORT: 2/1R

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU CROSSFEED VLV 3/4/5
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, MCA 1

PART NUMBER: 54V76All4K71, K72; K37, K33

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

WHEN GPC COMMANDS CLOSE ONLY THE OTHER VALVE "FU (OX) XFEED 3/4/5 VALVE", THEN THIS VALVE (ASSOCIATED WITH THE FAILED RELAY) "OX (FU) XFEED 3/4/5 VALVE" WILL ALSO CLOSE. VALVE CAN STILL BE OPENED. FOR LOSS OF ALL REDUNDANCY THIS UNINTENDED EVENT'S EFFECTS ARE SIMILAR TO THE VALVE FAILS TO OPEN CASE. THIS CASE RESULTS IN AFFECTING CROSSFEED OPERATIONS, AND MAY RESULT IN NEXT ASSOCIATED FAILURE (VALVE 1/2) CAUSING INABILITY TO BALANCE AND/OR EXPEL PROPELLANT RESULTING IN THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES BEING EXCEEDED. THERE IS NO REDUNDANCY TO CROSSFEED TO THE 1/2 THRUSTERS ONORBIT, AND NO REDUNDANCY DURING RTLS BECAUSE OF THE FIXED DUMP LENGTH.

HIGHEST CRITICALITY HDW/FUNC 1/21/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS 1/1 ABORT: MDAC ID: 1573

RELAY ITEM:

FAILURE MODE: FAILS OPEN

SUBSYS LEAD: D.J. PAUL LEAD ANALYST: W.A. HAUFLER

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 1, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8) 9)

CRITICALITIES

	CVTITOUTIE		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
	• .	TAL:	3/2R
	•	AOA:	3/2R
	3/1R	ATO:	3/2R
LANDING/SAFING	: 3/3		
LIFTOFF: ONORBIT: DEORBIT:	3/3 3/2R 3/1R	AOA:	3/2R

REDUNDANCY SCREENS: A [2] B [F] C [P]

AV BAY 5, MCA 2 LOCATION: PART NUMBER: 55V76A115K22; K23

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 1 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 1 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1574 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-, +

REDUNDANCY SCREENS: A [] B [·]· C []

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76All5K22; K23

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 1 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 1 ISOL VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO CLOSE, BUT WILL NOT DAMAGE VALVE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 1/2.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1575 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76All5K20; K21

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 1 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 1 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 1/2.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1576 ABORT: 1/1

ITEM:

RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 1, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76All5K20; K2l

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 1 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 1 ISOL VALVE". ROUTES REVERSE (CLOSING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO OPEN, BUT WILL NOT DAMAGE VALVE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/21/87

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1577 1/1 ABORT:

ITEM:

RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, MCA 1 PART NUMBER: 54V76All4K24; K22

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 2 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 2 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1578 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH:	HDW/FUNC	ABORT RTLS: TAL:	HDW/FUNC 3/3 3/3
LIFTOFF: ONORBIT:	3/3 3/3	AOA: ATO:	3/3 3/3
DEORBIT: LANDING/SAFING:	3/3 3/3	AIO.	, 3/ 3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114K24; K22

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 2 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 2 ISOL VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO CLOSE, BUT WILL NOT DAMAGE VALVE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 1/2.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/21/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1579

RELAY ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 2, L/R OX & FU ISOL VLVS
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] · · C []

LOCATION: AV BAY 4, MCA 1 PART NUMBER: 54V76A114K23; K21

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 2 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 2 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 1/2.

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1580 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 2, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76All4K23; K21

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 2 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 2 ISOL VALVE". ROUTES REVERSE (CLOSING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO OPEN, BUT WILL NOT DAMAGE VALVE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: ARCS 1/1 ABORT: MDAC ID: 1581

RELAY ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

MANIFOLD 3, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	•		·

REDUNDANCY SCREENS: A [2] B [F] C [P]

AV BAY 6, MCA 3 LOCATION: PART NUMBER: 56V76All6Kl9; K21

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 3 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 3 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1582

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- 5) RELAY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3 PART NUMBER: 56V76A116K19; K21

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 3 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 3 ISOL VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO CLOSE, BUT WILL NOT DAMAGE VALVE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 3/4/5 A OR В.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1583

RELAY ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS
- 6)
- 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3 PART NUMBER: 56V76All6Kl8; K20

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 3 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 3 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 3/4/5 A OR B.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/22/87

SUBSYSTEM: ARCS FLIGHT: 3/1R ABORT: MDAC ID: 1584 1/1

ITEM: RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 3, L/R OX & FU ISOL VLVS

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, MCA 3 PART NUMBER: 56V76All6Kl8; K20

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 3 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 3 ISOL VALVE". ROUTES REVERSE (CLOSING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO OPEN, BUT WILL NOT DAMAGE VALVE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/1R MDAC ID: 1585 ABORT: 1/1

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		-,:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76All6K23; K25

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 4 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 4 ISOL VALVE". THIS VALVE WILL REMAIN OPEN ONLY IF THE VALVES WERE OPEN AT TIME OF FAILURE AND IF THE VALVES ARE NOT COMMANDED CLOSED SINCE FAILURE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

HIGHEST CRITICALITY HDW/FUNC 1/22/87 DATE:

FLIGHT: 3/3 ABORT: 3/3 SUBSYSTEM: ARCS MDAC ID: 1586

RELAY ITEM:

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM

4) MANIFOLD 4, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT	HDW/FUNC
	3/3	RTLS:	3/3
	3/3	TAL:	3/3
	3/3	AOA:	3/3
	3/3	ATO:	3/3
DEORBIT: LANDIN G/SAF ING:		ATO:	3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3 PART NUMBER: 56V76A116K23; K25

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 4 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 4 ISOL VALVE". ROUTES FORWARD (OPENING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO CLOSE, BUT WILL NOT DAMAGE VALVE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 3/4/5 A OR В.

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1587 ABORT: 3/3

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) MANIFOLD 4, L/R OX & FU ISOL VLVS
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76All6K22; K24

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 4 ISOL SWITCH" TO CLOSE THE "OX & FU MANIF 4 ISOL VALVES". THE VALVES WILL REMAIN CLOSED ONLY IF THE VALVES WERE CLOSED AT TIME OF FAILURE AND IF NOT COMMANDED OPENED SINCE FAILURE. EFFECTS ARE THE SAME AS VALVES FAIL TO CLOSE CASE. HOWEVER, PROPELLANT CAN BE ISOLATED FROM THRUSTERS BY THE TANK ISOLATION VALVE 3/4/5 A OR B.

1/22/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS

MDAC ID: 1588

FLIGHT: 3/1R ABORT:

1/1

ITEM:

RELAY

FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

1) ELECTRICAL COMPONENTS

2) CONTROLS

3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS

5) RELAY

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	: 3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, MCA 3 PART NUMBER: 56V76A116K22; K24

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY OF GPC AND "AFT L/R RCS MANIF 4 ISOL SWITCH" TO OPEN THE "OX & FU MANIF 4 ISOL VALVE". ROUTES REVERSE (CLOSING) POWER TO VALVE MOTORS WHILE UNCOMMANDED, AND NO POWER WHILE COMMANDED TO OPEN, BUT WILL NOT DAMAGE VALVE. EFFECT WOULD BE THE SAME AS VALVES FAIL TO OPEN CASE. DURING ENTRY, THIS CASE MAY RESULT IN AFFECTING ENTRY DTOS AND PTIS. DURING RTLS, JETS ON OTHER MANIFOLDS FIRING IN THE SAME DIRECTION AS THOSE ON THIS MANIFOLD ARE NOT CONSIDERED TO BE REDUNDANT, SINCE LOSS OF THE 3 PRIMARY JETS ON THIS MANIFOLD MAY CAUSE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET TANK LANDING CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1589 ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 12K 1/4W

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J3-99; J3-71

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "OX TK ISOL 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: ARCS 3/3 MDAC ID: 1590 ABORT:

RESISTOR, 12K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 12K 1/4W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116R J3-99; J3-71

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "OX TK ISOL 1/2 VALVE" IN OPENED POSITION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87 DATE:

DATE: 1/3 SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1591

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J3-99; J3-71

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "OX TK ISOL 1/2 VALVE" IN OPENED POSITION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1592 ABORT: 3/3

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J3-99; J3-71

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "OX TK ISOL 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1593 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 1.2K 2W

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	·HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J2-61; J5-16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY TO STOP THE "OX & FU ISOL 1/2 VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L RCS TK ISOL 1/2 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE THE TWO "OX ISOL VALVE" POSITION TALKBACKS AND BARBERPOLE INDICATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1594 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 1.2K 2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116R J2-61; J5-16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1595 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 1.2K 2W

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76Al16R J2-52; J5-17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY TO STOP THE "OX ISOL 1/2 VALVE" MOTORS WHEN VALVE REACHES OPEN POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 1/2 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC OPEN OR CLOSE VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO BARBERPOLE INDICATION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1596 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 1.2K 2W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116R J2-52; J5-17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1597 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-/ •

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76Al16R J2-28; J5-57

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE TALKBACK FOR "AFT L/R RCS TK ISOL 1/2 SWITCH" IN OPEN

POSITION.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1598 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J2-28; J5-57

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1599 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76A116R J2-51; J5-18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE CAPABILITY TO STOP THE "FU ISOL 1/2 VALVE" MOTORS WHEN VALVE REACHES OPEN POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 1/2 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO BARBERPOLE INDICATION.

1/19/87 DATE: HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1600

ITEM: RESISTOR, 1.2K 2W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 1.2K 2W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3		•	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76Al16R J2-51; J5-18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECT. TALKBACK IS STILL AVAILABLE.

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1601 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76Al16R J2-27; J5-13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE TALKBACK FOR "AFT L RCS TK ISOL 1/2 SWITCH" IN CLOSED

POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE

SYSTEMS HANDBOOK

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1602

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	: 3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J2-27; J5-13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

NO EFFECTS. TALKBACK IS STILL AVAILABLE TO GPC.

DATE: HIGHEST CRITICALITY HDW/FUNC 1/19/87

SUBSYSTEM: ARCS FLIGHT: 3/3 1603 ABORT: MDAC ID: 3/3

ITEM:

RESISTOR, 12K 1/4W FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 12K 1/4W
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J3-109; J3-122

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "FU TK ISOL 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

HIGHEST CRITICALITY HDW/FUNC DATE: 1/19/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 1604 MDAC ID:

RESISTOR, 12K 1/4W ITEM:

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 12K 1/4W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [] B [] C []

AV BAY 6, MCA 3 LOCATION:

PART NUMBER: 56V76All6R J3-109; J3-122

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "FU TK ISOL 1/2 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE

SYSTEMS HANDBOOK

DATE: 1/19/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: ARCS FLIGHT: 3/3 MDAC ID: 1605 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 5.1K 1/4W
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76Al16R J3-109; J3-122

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

LOSE TALKBACK FOR THE "FU TK ISOL 1/2 VALVE" IN OPENED POSITION.

HIGHEST CRITICALITY HDW/FUNC 1/19/87

FLIGHT: 3/3 SUBSYSTEM: ARCS ABORT: 3/3 MDAC ID: 1606

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:

- 1) ELECTRICAL COMPONENTS
- 2) CONTROLS
- 3) PROP STOR & DIST SUBSYSTEM
- 4) L/R OX & FU TK ISOL VLV 1/2
- 5) RESISTOR, 5.1K 1/4W

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
3/3	RTLS:	3/3
3/3	TAL:	3/3
3/3	AOA:	3/3
3/3	ATO:	3/3
3/3		
	3/3 3/3 3/3 3/3	3/3 RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: AV BAY 6, MCA 3

PART NUMBER: 56V76All6R J3-109; J3-122

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL

SHOCK, OVERLOAD

EFFECTS/RATIONALE:

AFFECT TALKBACK FOR THE "FU TK ISOL 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

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